MILL MINE & RAILWAY SUPPLIES

Catalog 916

The FAIRBANKS *Company*

MILL MINE & RAILWAY SUPPLIES

Catalog 916

This catalog supersedes all
previous issues

The FAIRBANKS Company

Administrative Offices: NEW YORK CITY

BRANCH HOUSES

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FOREWORD

IN addition to our complete line of MILL, MINE AND RAILWAY SUPPLIES as listed, we are including in this catalog a partial list of the most popular types of the well known Fairbanks lines.

It is impossible to issue a general catalog, which to be complete would be too bulky for ordinary use. We are therefore issuing separate catalogs for each of our principal lines and shall be pleased to respond to your request for catalogs.

The "Fairbanks O. K." guarantees each article as to quality, workmanship and price. We carry a complete line of mechanical equipment consisting of:

Scales
Valves
Engines and Pumps
Machine Tools
Power Transmission
Trucks and Wheelbarrows
Automobile and Service Station Equipment
Electric Motors

PRICES in this catalog are revised to agree with the latest lists at the time of issue and are subject to change without notice.

Owing to the variety of goods listed and the constant changing of prices, it is impossible to issue a discount sheet. Requests for prices will receive immediate attention.

TERMS are thirty days net or two per cent discount if paid within ten days from date of invoice.

We solicit new accounts on a credit basis and in order to give prompt service request that purchasers not rated by the Commercial Agencies forward references or other information of a credit character with the order.

ORDERS should specify the number or symbol of each article. Wherever possible each article has been given a figure number.

TAPER SHANK TWIST DRILLS

Fig.

NO. 106—CARBON STEEL NO. 403—HIGH SPEED STEEL

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed			Carbon Steel	High Speed			Carbon Steel	High Speed
1/16	4 3/8	$0.45	$0.90	7/8	10 1/2	$2.60	$4.75	143/64	15 3/4	$11.50	$23.00	2 15/32	19	$29.75	$62.50
5/64	4 1/2	.45	.90	57/64	10 5/8	2.80	5.15	1 11/16	15 3/4	11.50	23.00	2 31/64	19	30.50	65.00
3/32	4 1/2	.45	.90	29/32	10 5/8	2.80	5.15	1 45/64	15 7/8	12.00	24.00	2 1/2	19	30.50	65.00
7/64	4 5/8	.45	.90	59/64	10 3/4	3.00	5.50	1 23/32	15 7/8	12.00	24.00	2 33/64	19 1/4	31.25	67.50
1/8	5 1/8	.45	.90	15/16	10 3/4	3.00	5.50	1 47/64	16	12.50	25.00	2 17/32	19 1/4	31.25	67.50
9/64	5 1/4	.45	.90	61/64	10 7/8	3.25	5.90	1 3/4	16	12.50	25.00	2 35/64	19 1/4	32.00	70.00
5/32	5 3/8	.45	.90	31/32	10 7/8	3.25	5.90	1 49/64	16 1/8	13.25	26.25	2 9/16	19 1/4	32.00	70.00
11/64	5 3/4	.50	.90	63/64	11	3.50	6.25	1 25/32	16 1/8	13.25	26.25	2 37/64	19 1/2	33.00	72.50
3/16	5 3/4	.50	.90	1	11	3.50	6.25	1 51/64	16 1/4	14.00	27.50	2 19/32	19 1/2	33.00	72.50
13/64	5 7/8	.55	1.00	1 1/64	11 1/8	3.75	6.75	1 13/16	16 1/4	14.00	27.50	2 39/64	19 1/2	34.00	75.00
7/32	5 7/8	.55	1.00	1 1/32	11 1/8	3.75	6.75	1 53/64	16 3/8	14.75	28.75	2 5/8	19 1/2	34.00	75.00
15/64	6 1/8	.60	1.10	1 3/64	11 1/4	4.00	7.25	1 27/32	16 3/8	14.75	28.75	2 41/64	20	35.00	77.50
1/4	6 1/8	.60	1.10	1 1/16	11 1/4	4.00	7.25	1 55/64	16 1/2	15.50	30.00	2 21/32	20	35.00	77.50
17/64	6 1/4	.65	1.20	1 5/64	11 1/2	4.25	7.75	1 7/8	16 1/2	15.50	30.00	2 43/64	20	36.00	80.00
9/32	6 1/4	.65	1.20	1 3/32	11 1/2	4.25	7.75	1 57/64	16 1/2	16.25	31.25	2 11/16	20	36.00	80.00
19/64	6 3/8	.70	1.30	1 7/64	11 3/4	4.50	8.25	1 29/32	16 1/2	16.25	31.25	2 45/64	20 1/2	37.00	82.50
5/16	6 3/8	.70	1.30	1 1/8	11 3/4	4.50	8.25	1 59/64	16 1/2	17.00	32.50	2 23/32	20 1/2	37.00	82.50
21/64	6 1/2	.75	1.40	1 9/64	11 7/8	4.75	8.90	1 15/16	16 1/2	17.00	32.50	2 47/64	20 1/2	38.00	85.00
11/32	6 1/2	.75	1.40	1 5/32	11 7/8	4.75	8.90	1 61/64	16 1/2	17.75	33.75	2 3/4	20 1/2	38.00	85.00
23/64	6 3/4	.80	1.50	1 11/64	12	5.00	9.50	1 31/32	16 1/2	17.75	33.75	2 49/64	20 1/2	39.25	87.50
3/8	6 3/4	.80	1.50	1 3/16	12	5.00	9.50	1 63/64	16 1/2	18.50	35.00	2 25/32	20 1/2	39.25	87.50
25/64	7	.90	1.65	1 13/64	12 1/8	5.25	10.15	2	16 1/2	18.50	35.00	2 51/64	20 1/2	40.50	90.00
13/32	7	.90	1.65	1 7/32	12 1/8	5.25	10.15	2 1/64	16 1/2	19.25	36.25	2 13/16	20 1/2	40.50	90.00
27/64	7 1/4	1.00	1.75	1 15/64	12 1/2	5.50	10.75	2 1/32	16 1/2	19.25	36.25	2 53/64	21	41.75	92.50
7/16	7 1/4	1.00	1.75	1 1/4	12 1/2	5.50	10.75	2 3/64	17	20.00	37.50	2 27/32	21	41.75	92.50
29/64	7 1/2	1.10	1.90	1 17/64	14 1/8	5.75	11.50	2 1/16	17	20.00	37.50	2 55/64	21	43.00	95.00
15/32	7 1/2	1.10	1.90	1 9/32	14 1/8	5.75	11.50	2 5/64	17	20.75	38.75	2 7/8	21	43.00	95.00
31/64	7 3/4	1.20	2.00	1 19/64	14 1/4	6.00	12.25	2 3/32	17	20.75	38.75	2 57/64	21	44.25	97.50
1/2	7 3/4	1.20	2.00	1 5/16	14 1/4	6.00	12.25	2 7/64	17	21.50	40.00	2 29/32	21	44.25	97.50
33/64	8	1.30	2.15	1 21/64	14 3/8	6.25	13.00	2 1/8	17	21.50	40.00	2 59/64	21	45.50	100.00
17/32	8	1.30	2.15	1 11/32	14 3/8	6.25	13.00	2 9/64	17	22.25	41.25	2 15/16	21	45.50	100.00
35/64	8 1/4	1.40	2.25	1 23/64	14 1/2	6.50	13.75	2 5/32	17	22.25	41.25	2 61/64	22	46.75	102.50
9/16	8 1/4	1.40	2.25	1 3/8	14 1/2	6.50	13.75	2 11/64	17	23.00	42.50	2 31/32	22	46.75	102.50
37/64	8 1/2	1.50	2.40	1 25/64	14 5/8	7.00	14.65	2 3/16	17	23.00	42.50	2 63/64	22	48.00	105.00
19/32	8 1/2	1.50	2.40	1 13/32	14 5/8	7.00	14.65	2 13/64	17 1/2	23.75	43.75	3	22	48.00	105.00
39/64	8 3/4	1.60	2.50	1 27/64	14 3/4	7.50	15.50	2 7/32	17 1/2	23.75	43.75	3 1/16	22	52.00	112.50
5/8	8 3/4	1.60	2.50	1 7/16	14 3/4	7.50	15.50	2 15/64	17 1/2	24.50	45.00	3 1/8	22	56.00	120.00
41/64	9	1.70	2.75	1 29/64	14 7/8	8.00	16.40	2 1/4	17 1/2	24.50	45.00	3 3/16	22	60.00	127.50
21/32	9	1.70	2.75	1 15/32	14 7/8	8.00	16.40	2 17/64	17 1/2	25.25	47.50	3 1/4	23	65.00	135.00
43/64	9 1/4	1.80	3.00	1 31/64	15	8.50	17.25	2 9/32	17 1/2	25.25	47.50	3 5/16	23	70.00	142.50
11/16	9 1/4	1.80	3.00	1 1/2	15	8.50	17.25	2 19/64	17 1/2	26.00	50.00	3 3/8	23	75.00	150.00
45/64	9 1/2	1.90	3.25	1 33/64	15 1/8	9.00	18.15	2 5/16	17 1/2	26.00	50.00	3 7/16	23	80.00	157.50
23/32	9 1/2	1.90	3.25	1 17/32	15 1/8	9.00	18.15	2 21/64	18	26.75	52.50	3 1/2	24	85.00	165.00
47/64	9 3/4	2.00	3.50	1 35/64	15 1/4	9.50	19.00	2 11/32	18	26.75	52.50	3 9/16	24	91.00	172.50
3/4	9 3/4	2.00	3.50	1 9/16	15 1/4	9.50	19.00	2 23/64	18	27.50	55.00	3 5/8	24	98.00	180.00
49/64	9 7/8	2.10	3.75	1 37/64	15 3/8	10.00	20.00	2 3/8	18	27.50	55.00	3 11/16	24	105.00	187.50
25/32	9 7/8	2.10	3.75	1 19/32	15 3/8	10.00	20.00	2 25/64	18 1/2	28.25	57.50	3 3/4	24	112.00	195.00
51/64	10	2.20	4.00	1 39/64	15 1/2	10.50	21.00	2 13/32	18 1/2	28.25	57.50	3 13/16	24	119.00	202.50
13/16	10	2.20	4.00	1 5/8	15 1/2	10.50	21.00	2 27/64	18 1/2	29.00	60.00	3 7/8	24	126.00	210.00
53/64	10 1/4	2.40	4.40	1 41/64	15 5/8	11.00	22.00	2 7/16	18 1/2	29.00	60.00	3 15/16	24	133.00	217.50
27/32	10 1/4	2.40	4.40	1 21/32	15 5/8	11.00	22.00	2 29/64	19	29.75	62.50	4	25	140.00	225.00
55/64	10 1/2	2.60	4.75												

Discount on carbon steel drills changes at 1½-inch.

TAPER SHANKS ON DRILLS

Diameter of Drill, Inches	1/16 to 9/16	37/64 to 29/32	59/64 to 1 1/4	1 13/64 to 2	2 1/64 to 3	3 1/16 to 4
Taper Shank Nos.	1	2	3	4	5	6
Length of Taper, Inches	2 11/16	3 3/16	3 15/16	5 1/8	6 3/8	8 3/4
Taper per Foot, Inches	.600	.602	.602	.623	.630	.626
Thickness of Tang, Inches	13/64	1/4	5/16	15/32	5/8	3/4

STRAIGHT SHANK TWIST DRILLS

LONG SET

Fig. 2

NO. 110—CARBON STEEL NO. 415—HIGH SPEED STEEL

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed			Carbon Steel	High Speed			Carbon Steel	High Speed
1/16	3 5/8	$0.45	$0.90	7/8	10 1/2	$2.60	$4.75	143/64	15 3/4	$11.50	$23.00	215/32	19	$29.75	$62.50
5/64	4	.45	.90	57/64	10 5/8	2.80	5.15	111/16	15 3/4	11.50	23.00	231/64	19	30.50	65.00
3/32	4 3/8	.45	.90	29/32	10 5/8	2.80	5.15	145/64	15 7/8	12.00	24.00	2 1/2	19	30.50	65.00
7/64	4 3/4	.45	.90	59/64	10 3/4	3.00	5.50	123/32	15 7/8	12.00	24.00	233/64	19 1/4	31.25	67.50
1/8	5 1/8	.45	.90	15/16	10 3/4	3.00	5.50	147/64	16	12.50	25.00	217/32	19 1/4	31.25	67.50
9/64	5 3/8	.45	.90	61/64	10 7/8	3.25	5.90	1 3/4	16	12.50	25.00	235/64	19 1/4	32.00	70.00
5/32	5 3/8	.45	.90	31/32	10 7/8	3.25	5.90	149/64	16 1/8	13.25	26.25	29/16	19 1/4	32.00	70.00
11/64	5 3/4	.50	.90	63/64	11	3.50	6.25	125/32	16 1/8	13.25	26.25	237/64	19 1/2	33.00	72.50
3/16	5 3/4	.50	.90	1	11	3.50	6.25	151/64	16 1/4	14.00	27.50	219/32	19 1/2	33.00	72.50
13/64	5 7/8	.55	1.00	1 1/64	11 1/8	3.75	6.75	113/16	16 1/4	14.00	27.50	239/64	19 1/2	34.00	75.00
7/32	5 7/8	.55	1.00	1 1/32	11 1/8	3.75	6.75	153/64	16 3/8	14.75	28.75	25/8	19 1/2	34.00	75.00
15/64	6 1/8	.60	1.10	1 3/64	11 1/4	4.00	7.25	127/32	16 3/8	14.75	28.75	241/64	20	35.00	77.50
1/4	6 1/8	.60	1.10	1 1/16	11 1/4	4.00	7.25	155/64	16 1/2	15.50	30.00	221/32	20	35.00	77.50
17/64	6 1/4	.65	1.20	1 5/64	11 1/2	4.25	7.75	17/8	16 1/2	15.50	30.00	243/64	20	36.00	80.00
9/32	6 1/4	.65	1.20	1 3/32	11 1/2	4.25	7.75	157/64	16 1/2	16.25	31.25	211/16	20	36.00	80.00
19/64	6 3/8	.70	1.30	1 7/64	11 3/4	4.50	8.25	129/32	16 1/2	16.25	31.25	245/64	20 1/2	37.00	82.50
5/16	6 3/8	.70	1.30	1 1/8	11 3/4	4.50	8.25	159/64	16 1/2	17.00	32.50	223/32	20 1/2	37.00	82.50
21/64	6 1/2	.75	1.40	1 9/64	11 7/8	4.75	8.90	115/16	16 1/2	17.00	32.50	247/64	20 1/2	38.00	85.00
11/32	6 1/2	.75	1.40	1 5/32	11 7/8	4.75	8.90	161/64	16 1/2	17.75	33.75	23/4	20 1/2	38.00	85.00
23/64	6 3/4	.80	1.50	1 11/64	12	5.00	9.50	131/32	16 1/2	17.75	33.75	249/64	20 1/2	39.25	87.50
3/8	6 3/4	.80	1.50	1 3/16	12	5.00	9.50	163/64	16 1/2	18.50	35.00	225/32	20 1/2	39.25	87.50
25/64	7	.90	1.65	1 13/64	12 1/8	5.25	10.15	2	16 1/2	18.50	35.00	251/64	20 1/2	40.50	90.00
13/32	7	.90	1.65	1 7/32	12 1/8	5.25	10.15	21/64	16 1/2	19.25	36.25	213/16	20 1/2	40.50	90.00
27/64	7 1/4	1.00	1.75	1 15/64	12 1/2	5.50	10.75	21/32	16 1/2	19.25	36.25	253/64	21	41.75	92.50
7/16	7 1/4	1.00	1.75	1 1/4	12 1/2	5.50	10.75	23/64	17	20.00	37.50	227/32	21	41.75	92.50
29/64	7 1/2	1.10	1.90	1 17/64	14 1/8	5.75	11.50	21/16	17	20.00	37.50	255/64	21	43.00	95.00
15/32	7 1/2	1.10	1.90	1 9/32	14 1/8	5.75	11.50	25/64	17	20.75	38.75	27/8	21	43.00	95.00
31/64	7 3/4	1.20	2.00	1 19/64	14 1/4	6.00	12.25	23/32	17	20.75	38.75	257/64	21	44.25	97.50
1/2	7 3/4	1.20	2.00	1 5/16	14 1/4	6.00	12.25	27/64	17	21.50	40.00	229/32	21	44.25	97.50
33/64	8	1.30	2.15	1 21/64	14 3/8	6.25	13.00	2 1/8	17	21.50	40.00	259/64	21	45.50	100.00
17/32	8	1.30	2.15	1 11/32	14 3/8	6.25	13.00	29/64	17	22.25	41.25	215/16	21	45.50	100.00
35/64	8 1/4	1.40	2.25	1 23/64	14 1/2	6.50	13.75	25/32	17	22.25	41.25	261/64	22	46.75	102.50
9/16	8 1/4	1.40	2.25	1 3/8	14 1/2	6.50	13.75	211/64	17	23.00	42.50	231/32	22	46.75	102.50
37/64	8 1/2	1.50	2.40	1 25/64	14 5/8	7.00	14.65	23/16	17	23.00	42.50	263/64	22	48.00	105.00
19/32	8 1/2	1.50	2.40	1 13/32	14 5/8	7.00	14.65	213/64	17 1/2	23.75	43.75	3	22	48.00	105.00
39/64	8 3/4	1.60	2.50	1 27/64	14 3/4	7.50	15.50	27/32	17 1/2	23.75	43.75	31/16	22	52.00	112.50
5/8	8 3/4	1.60	2.50	1 7/16	14 3/4	7.50	15.50	215/64	17 1/2	24.50	45.00	31/8	22	56.00	120.00
41/64	9	1.70	2.75	1 29/64	14 7/8	8.00	16.40	21/4	17 1/2	24.50	45.00	33/16	22	60.00	127.50
21/32	9	1.70	2.75	1 15/32	14 7/8	8.00	16.40	217/64	17 1/2	25.25	47.50	31/4	23	65.00	135.00
43/64	9 1/4	1.80	3.00	1 31/64	15	8.50	17.25	29/32	17 1/2	25.25	47.50	35/16	23	70.00	142.50
11/16	9 1/4	1.80	3.00	1 1/2	15	8.50	17.25	219/64	17 1/2	26.00	50.00	33/8	23	75.00	150.00
45/64	9 1/2	1.90	3.25	1 33/64	15 1/8	9.00	18.15	25/16	17 1/2	26.00	50.00	37/16	23	80.00	157.50
23/32	9 1/2	1.90	3.25	1 17/32	15 1/8	9.00	18.15	221/64	18	26.75	52.50	31/2	24	85.00	165.00
47/64	9 3/4	2.00	3.50	1 35/64	15 1/4	9.50	19.00	211/32	18	26.75	52.50	39/16	24	91.00	172.50
3/4	9 3/4	2.00	3.50	1 9/16	15 1/4	9.50	19.00	223/64	18	27.50	55.00	35/8	24	98.00	180.00
49/64	9 7/8	2.10	3.75	1 37/64	15 3/8	10.00	20.00	23/8	18	27.50	55.00	311/16	24	105.00	187.50
25/32	9 7/8	2.10	3.75	1 19/32	15 3/8	10.00	20.00	225/64	18 1/2	28.25	57.50	33/4	24	112.00	195.00
51/64	10	2.20	4.00	1 39/64	15 1/2	10.50	21.00	213/32	18 1/2	28.25	57.50	313/16	24	119.00	202.50
13/16	10	2.20	4.00	1 5/8	15 1/2	10.50	21.00	227/64	18 1/2	29.00	60.00	37/8	24	126.00	210.00
53/64	10 1/4	2.40	4.40	1 41/64	15 5/8	11.00	22.00	27/16	18 1/2	29.00	60.00	315/16	24	133.00	217.50
27/32	10 1/4	2.40	4.40	1 21/32	15 5/8	11.00	22.00	229/64	19	29.75	62.50	4	25	140.00	225.00
55/64	10 1/2	2.60	4.75												

Discount on Carbon Steel Drills changes at 1½ Inch.

STRAIGHT SHANK, STRAIGHT FLUTED DRILLS

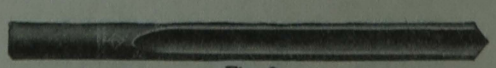

Fig. 3

NO. 145—SHORT SET NO. 166—WIRE GAUGE

These Drills are especially adapted for work in brass, copper or other soft metals, as they will not run ahead or "grab." Have the same dimensions and list prices as Short Set and Wire Gauge Straight Shank Drills listed on a following page. Will be furnished of high speed steel to order.

STRAIGHT SHANK TWIST DRILLS

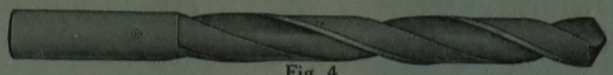

Fig. 4

NO. 108A—CARBON STEEL Wire Gauge

Wire Gauge No.	Decimal Dia., Inches	Length Over All, Inches	Per Dozen Carbon Steel	Per Dozen High Speed
1	.2280	4	$2.75	$7.00
2	.2210	3 15/16	2.75	7.00
3	.2130	3 15/16	2.75	7.00
4	.2090	3 7/8	2.75	7.00
5	.2055	3 13/16	2.75	7.00
6	.2040	3 13/16	2.50	7.00
7	.2010	3 3/4	2.50	7.00
8	.1990	3 11/16	2.50	7.00
9	.1960	3 11/16	2.50	7.00
10	.1935	3 5/8	2.50	7.00
11	.1910	3 9/16	2.25	6.30
12	.1890	3 9/16	2.25	6.30
13	.1850	3 1/2	2.25	6.30
14	.1820	3 7/16	2.25	6.30
15	.1800	3 7/16	2.25	6.30
16	.1770	3 3/8	2.00	6.30
17	.1730	3 5/16	2.00	6.30
18	.1695	3 5/16	2.00	6.30
19	.1660	3 1/4	2.00	6.30
20	.1610	3 3/16	2.00	6.30
21	.1590	3 3/16	1.90	6.10
22	.1570	3 1/8	1.90	6.10
23	.1540	3 1/16	1.90	6.10
24	.1520	3 1/16	1.90	6.10
25	.1495	3	1.90	6.10
26	.1470	2 15/16	1.80	6.10
27	.1440	2 15/16	1.80	6.10

NO. 418—HIGH SPEED STEEL Wire Gauge

Wire Gauge No.	Decimal Dia., Inches	Length Over All, Inches	Per Dozen Carbon Steel	Per Dozen High Speed
28	.1405	2 7/8	$1.80	$6.10
29	.1360	2 13/16	1.80	6.10
30	.1285	2 13/16	1.80	6.10
31	.1200	2 3/4	1.75	5.90
32	.1160	2 11/16	1.75	5.90
33	.1130	2 11/16	1.75	5.90
34	.1110	2 5/8	1.75	5.90
35	.1100	2 9/16	1.75	5.90
36	.1065	2 9/16	1.75	5.90
37	.1040	2 1/2	1.75	5.90
38	.1015	2 7/16	1.75	5.90
39	.0995	2 7/16	1.75	5.90
40	.0980	2 3/8	1.75	5.90
41	.0960	2 5/16	1.70	5.70
42	.0935	2 5/16	1.70	5.70
43	.0890	2 1/4	1.70	5.70
44	.0860	2 3/16	1.70	5.70
45	.0820	2 3/16	1.70	5.70
46	.0810	2 1/8	1.65	5.70
47	.0785	2 1/16	1.65	5.70
48	.0760	2 1/16	1.65	5.70
49	.0730	2	1.65	5.70
50	.0700	1 15/16	1.65	5.70
51	.0670	1 15/16	1.60	5.70
52	.0635	1 7/8	1.60	5.70
53	.0595	1 13/16	1.60	5.70
54	.0550	1 13/16	1.60	5.70

Wire Gauge No.	Decimal Dia., Inches	Length Over All, Inches	Per Dozen Carbon Steel	Per Dozen High Speed
55	.0520	1 3/4	$1.60	$5.70
56	.0465	1 11/16	1.55	5.70
57	.0430	1 11/16	1.55	5.70
58	.0420	1 5/8	1.55	5.70
59	.0410	1 9/16	1.55	5.70
60	.0400	1 9/16	1.55	5.70
61	.0390	1 1/2	1.50	.....
62	.0380	1 1/2	1.50	.....
63	.0370	1 1/2	1.50	.....
64	.0360	1 1/2	1.50	.....
65	.0350	1 1/2	1.50	.....
66	.0330	1 1/2	1.50	.....
67	.0320	1 7/16	1.50	.....
68	.0310	1 7/16	1.50	.....
69	.02925	1 3/8	1.50	.....
70	.0280	1 5/16	1.50	.....
71	.0260	1 5/16	1.50	.....
72	.0250	1 1/4	1.50	.....
73	.0240	1 3/16	1.50	.....
74	.0225	1 1/8	1.50	.....
75	.0210	1 1/16	1.50	.....
76	.0200	1	1.50	.....
77	.0180	15/16	1.50	.....
78	.0160	7/8	1.50	.....
79	.0145	13/16	1.50	.....
80	.0135	3/4	1.50	.....

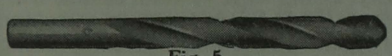

Fig. 5

SHORT SET
NO. 108—CARBON STEEL
NO. 417—HIGH SPEED STEEL

Dia., Ins.	Length Over All, Ins.	Per Dozen Carbon Steel	Per Dozen High Speed
1/32	1 1/2	$1.50	.....
3/64	1 3/4	1.55	.....
1/16	2 1/2	1.60	$5.70
5/64	2 5/8	1.65	5.70
3/32	2 3/4	1.70	5.70
7/64	2 7/8	1.75	5.90
1/8	3	1.80	5.90
9/64	3 1/8	1.85	6.10
5/32	3 1/4	1.90	6.10
11/64	3 3/8	2.00	6.30
3/16	3 1/2	2.25	6.30
13/64	3 5/8	2.50	7.00
7/32	3 3/4	2.75	7.00
15/64	3 7/8	3.00	7.35
1/4	4	3.25	7.35
17/64	4 1/8	3.50	9.10

Dia., Ins.	Length Over All, Ins.	Per Dozen Carbon Steel	Per Dozen High Speed
9/32	4 1/4	$3.80	$9.10
19/64	4 3/8	4.00	10.50
5/16	4 1/2	4.35	10.50
21/64	4 5/8	4.70	12.00
11/32	4 3/4	5.05	12.00
23/64	4 7/8	5.50	13.50
3/8	5	6.00	13.50
25/64	5 1/8	6.50	15.00
13/32	5 1/4	7.00	15.00
27/64	5 3/8	7.75	17.00
7/16	5 1/2	8.50	17.00
29/64	5 5/8	9.25	18.75
15/32	5 3/4	10.00	18.75
31/64	5 7/8	11.00	20.00
1/2	6	12.00	20.00

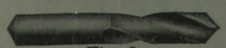

Fig. 6

NO. 125—CENTER DRILLS

Dia., Inches	Length, Inches	Per Dozen	Dia., Inches	Length, Inches	Per Dozen
1/16	1	$1.60	11/64	1 1/2	$2.00
5/64	1	1.65	3/16	1 1/2	2.25
3/32	1 1/4	1.70	13/64	1 1/2	2.50
7/64	1 1/4	1.75	7/32	1 1/2	2.75
1/8	1 1/4	1.80	15/64	1 1/2	3.00
9/64	1 1/4	1.35	1/4	1 1/2	3.25
5/32	1 1/2	1.90	17/64	1 1/2	3.50

Fig. 7

LETTER SIZES
NO. 109—CARBON STEEL
NO. 419—HIGH SPEED STEEL

Diameter, Inches	Decimal Diameter, Inches	Length Over All, Inches	Per Dozen Carbon Steel	Per Dozen High Speed
A	.234	3 13/16	$3.00	$7.35
B	.238	3 13/16	3.05	7.35
C	.242	3 13/16	3.10	7.35
D	.246	3 13/16	3.15	7.35
E	.250	3 13/16	3.25	7.35
F	.257	4 1/4	3.35	9.10
G	.261	4 1/4	3.45	9.10
H	.266	4 1/4	3.55	9.10
I	.272	4 1/4	3.65	9.10
J	.277	4 1/4	3.70	9.10
K	.281	4 1/4	3.80	9.10
L	.290	4 1/4	3.90	10.50
M	.295	4 1/4	4.00	10.50
N	.302	4 1/4	4.25	10.50
O	.316	4 1/4	4.40	10.50
P	.323	4 5/8	4.60	12.00
Q	.332	4 3/4	4.75	12.00
R	.339	4 3/4	5.00	12.00
S	.348	4 7/8	5.15	13.50
T	.358	4 7/8	5.30	13.50
U	.368	5	5.50	13.50
V	.377	5	6.00	13.50
W	.386	5 1/8	6.50	15.00
X	.397	5 1/4	6.75	15.00
Y	.404	5 1/4	7.00	15.00
Z	.413	5 3/8	7.25	17.00

TWIST DRILLS
FOR BLACKSMITH'S DRILL PRESSES

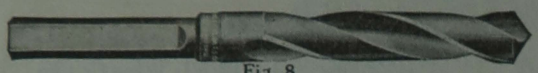

Fig. 8

NO. 120—½-Inch SHANK—SHORT SET
Shanks, ½-Inch Diameter and 2¼ Inches Long

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/8	4 7/8	$0.45	....	27/32	6	$2.00	$3.15
5/32	4 7/8	.45	....	7/8	6	2.10	3.30
3/16	5 5/8	.50	....	29/32	6	2.20	3.50
7/32	5 5/8	.55	....	15/16	6	2.30	3.70
1/4	6	.60	$1.10	31/32	6	2.40	3.90
9/32	6	.65	1.20	1	6	2.50	4.10
5/16	6	.70	1.30	1 1/32	6	2.60	4.30
11/32	6	.75	1.40	1 1/16	6	2.70	4.50
3/8	6	.80	1.45	1 3/32	6	2.80	4.75
13/32	6	.85	1.55	1 1/8	6	2.90	5.00
7/16	6	.90	1.60	1 5/32	6	3.00	5.25
15/32	6	.95	1.70	1 3/16	6	3.10	5.50
1/2	6	1.00	1.75	1 7/32	6	3.20	5.80
17/32	6	1.05	1.90	1 1/4	6	3.30	6.10
9/16	6	1.10	2.05	1 9/32	6	3.45	6.40
19/32	6	1.20	2.20	1 5/16	6	3.60	6.70
5/8	6	1.30	2.30	1 11/32	6	3.75	7.00
21/32	6	1.40	2.40	1 3/8	6	3.90	7.40
11/16	6	1.50	2.50	1 13/32	6	4.05	7.80
23/32	6	1.60	2.65	1 7/16	6	4.20	8.20
3/4	6	1.70	2.75	1 15/32	6	4.35	8.60
25/32	6	1.80	2.90	1 1/2	6	4.50	9.00
13/16	6	1.90	3.00				

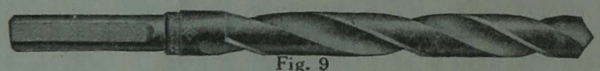

Fig. 9

NO. 118—½-Inch SHANK—LONG SET
Shanks, ½-Inch Diameter and 2½ Inches Long

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/8	5 1/8	$0.45	....	27/32	10 1/4	$2.40	$4.40
5/32	5 3/8	.45	....	7/8	10 1/2	2.60	4.75
3/16	5 5/8	.50	....	29/32	10 5/8	2.80	5.15
7/32	5 7/8	.55	....	15/16	10 3/4	3.00	5.50
1/4	6 1/8	.60	$1.10	31/32	10 7/8	3.25	5.90
9/32	6 1/4	.65	1.20	1	11	3.50	6.25
5/16	6 3/8	.70	1.30	1 1/32	11 1/8	3.75	6.75
11/32	6 1/2	.75	1.40	1 1/16	11 1/4	4.00	7.25
3/8	6 3/4	.80	1.50	1 3/32	11 1/2	4.25	7.75
13/32	7	.90	1.65	1 1/8	11 3/4	4.50	8.25
7/16	7 1/4	1.00	1.75	1 5/32	11 7/8	4.75	8.90
15/32	7 1/2	1.10	1.90	1 3/16	12	5.00	9.50
1/2	7 3/4	1.20	2.00	1 7/32	12 1/8	5.25	10.15
17/32	8	1.30	2.15	1 1/4	12 1/4	5.50	10.75
9/16	8 1/4	1.40	2.25	1 9/32	12 1/4	5.75	11.50
19/32	8 1/2	1.50	2.40	1 5/16	12 3/8	6.00	12.25
5/8	8 3/4	1.60	2.50	1 11/32	12 3/8	6.25	13.00
21/32	9	1.70	2.75	1 3/8	12 1/2	6.50	13.75
11/16	9 1/4	1.80	3.00	1 13/32	12 1/2	7.00	14.65
23/32	9 1/2	1.90	3.25	1 7/16	12 5/8	7.50	15.50
3/4	9 3/4	2.00	3.50	1 15/32	12 5/8	8.00	16.40
25/32	9 7/8	2.10	3.75	1 1/2	12 5/8	8.50	17.25
13/16	10	2.20	4.00				

High Speed Drills with ½-Inch Shanks will be furnished in sizes over ¾-Inch Diameter only at customer's risk, as we do not consider the Shanks strong enough.

Unless otherwise specified these Drills will always be furnished with flatted Shanks.

TWIST DRILLS
FOR BLACKSMITH'S DRILL PRESSES

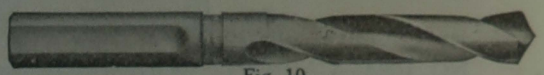

Fig. 10

NO. 116—⅝-Inch SHANK
Shank .648 Inch Diameter and 2¼ Inches Long

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/8	4 7/8	$0.50	....	27/32	6	$2.00	$3.15
5/32	4 7/8	.55	....	7/8	6	2.10	3.30
3/16	5 5/8	.60	....	29/32	6	2.20	3.50
7/32	5 5/8	.65	....	15/16	6	2.30	3.70
1/4	6	.70	$1.20	31/32	6	2.40	3.90
9/32	6	.75	1.30	1	6	2.50	4.10
5/16	6	.80	1.40	1 1/32	6	2.60	4.30
11/32	6	.85	1.50	1 1/16	6	2.70	4.50
3/8	6	.90	1.55	1 3/32	6	2.80	4.75
13/32	6	.95	1.65	1 1/8	6	2.90	5.00
7/16	6	1.00	1.70	1 5/32	6	3.00	5.25
15/32	6	1.05	1.80	1 3/16	6	3.10	5.50
1/2	6	1.10	1.85	1 7/32	6	3.20	5.80
17/32	6	1.15	1.95	1 1/4	6	3.30	6.10
9/16	6	1.20	2.05	1 9/32	6	3.45	6.40
19/32	6	1.25	2.20	1 5/16	6	3.60	6.70
5/8	6	1.30	2.30	1 11/32	6	3.75	7.00
21/32	6	1.40	2.40	1 3/8	6	3.90	7.40
11/16	6	1.50	2.50	1 13/32	6	4.05	7.80
23/32	6	1.60	2.65	1 7/16	6	4.20	8.20
3/4	6	1.70	2.75	1 15/32	6	4.35	8.60
25/32	6	1.80	2.90	1 1/2	6	4.50	9.00
13/16	6	1.90	3.00				

High Speed Drills with ⅝-Inch Shank will be furnished in sizes over ¾-Inch Diameter only at customer's risk, as we do not consider the Shanks strong enough.

Unless otherwise specified these Drills will always be furnished with flatted Shanks.

BIT STOCK DRILLS
FOR METAL OR WOOD

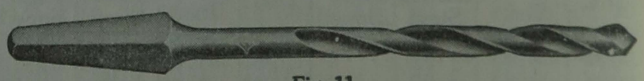

Fig. 11

NO. 114

Diameter, Inches	Length Over All, Inches	Per Dozen	Diameter, Inches	Length Over All, Inches	Per Dozen
1/16	3 5/16	$2.50	15/32	6 3/4	$11.75
5/64	3 7/16	2.60	1/2	7	13.00
3/32	3 9/16	2.70	17/32	7 1/4	14.25
7/64	3 11/16	2.85	9/16	7 1/2	15.50
1/8	3 13/16	3.00	19/32	7 1/2	16.75
9/64	3 15/16	3.25	5/8	7 1/2	18.00
5/32	4 1/16	3.50	21/32	7 1/2	19.50
11/64	4 3/16	3.75	11/16	7 1/2	21.00
3/16	4 5/16	4.00	23/32	7 1/2	22.50
13/64	4 3/4	4.25	3/4	7 1/2	24.00
7/32	4 3/4	4.50	25/32	7 1/2	25.50
15/64	5	4.75	13/16	7 1/2	27.00
1/4	5	5.00	27/32	7 1/2	28.50
17/64	5 1/4	5.50	7/8	7 1/2	30.00
9/32	5 1/4	6.00	29/32	7 1/2	31.50
19/64	5 1/2	6.50	15/16	7 1/2	33.00
5/16	5 1/2	7.00	31/32	7 1/2	34.50
21/64	5 3/4	7.50	1	7 1/2	36.00
11/32	5 3/4	8.00	1 1/16	7 1/2	39.00
3/8	6	8.50	1 1/8	7 1/2	42.00
13/32	6 1/4	9.25	1 3/16	7 1/2	45.00
7/16	6 1/2	10.50	1 1/4	7 1/2	48.00

Sizes 1/16 to 3/8 Inch, inclusive, packed One Dozen in a Box.

OIL TUBE DRILLS

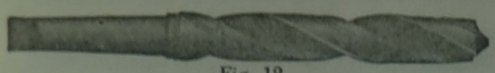

Fig. 12

TAPER SHANK

The holes in the shanks of these drills register with a channel in the body of the oil feeding socket, so that when the drill is inserted in the socket there is a continuous feed of oil to the cutting lips of the drill.

NO. 91—CARBON STEEL
NO. 426—HIGH SPEED STEEL

Diam., Ins.	Length Over All, Ins.	Each		Diam., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/2	7 3/4	$2.25	$5.00	19/32	14 1/8	$7.30	$18.65
17/32	8	2.40	5.40	15/16	14 1/4	7.60	19.75
9/16	8 1/4	2.60	5.75	111/32	14 3/8	8.00	20.90
19/32	8 1/2	2.80	6.15	1 3/8	14 1/2	8.50	22.00
5/8	8 3/4	3.00	6.50	113/32	14 5/8	9.10	23.15
21/32	9	3.20	6.90	17/16	14 3/4	9.75	24.25
11/16	9 1/4	3.40	7.25	115/32	14 7/8	10.35	25.50
23/32	9 1/2	3.60	7.65	1 1/2	15	10.95	26.75
3/4	9 3/4	3.80	8.00	117/32	15 1/8	11.50	28.00
25/32	9 7/8	4.00	8.40	19/16	15 1/4	12.00	29.25
13/16	10	4.20	8.75	119/32	15 3/8	12.50	30.50
27/32	10 1/4	4.40	9.15	15/8	15 1/2	13.00	31.75
7/8	10 1/2	4.60	9.50	121/32	15 5/8	13.50	33.00
29/32	10 5/8	4.80	10.00	111/16	15 3/4	14.00	34.25
15/16	10 3/4	5.00	10.50	123/32	15 7/8	14.50	35.75
31/32	10 7/8	5.20	11.00	1 3/4	16	15.00	37.25
1	11	5.40	11.50	125/32	16 1/8	15.50	38.75
1 1/32	11 1/8	5.60	12.00	113/16	16 1/4	16.00	40.25
1 1/16	11 1/4	5.80	12.50	127/32	16 3/8	16.50	41.90
1 3/32	11 1/2	6.00	13.25	17/8	16 1/2	17.00	43.50
1 1/8	11 3/4	6.20	14.00	129/32	16 1/2	17.50	45.15
1 5/32	11 7/8	6.40	14.75	115/16	16 1/2	18.00	46.75
1 3/16	12	6.60	15.50	131/32	16 1/2	18.50	48.40
1 7/32	12 1/8	6.80	16.50	2	16 1/2	19.00	50.00
1 1/4	12 1/2	7.00	17.50				

Sixty-fourth sizes take list price of next larger size.

TAPER SHANKS ON DRILLS

Diameter Drill, Ins..	1/2 to 9/16	19/32 to 29/32	15/16 to 1 1/4	1 9/32 to 2
Taper Shank, Nos...	1	2	3	4

OIL FEEDING SOCKETS

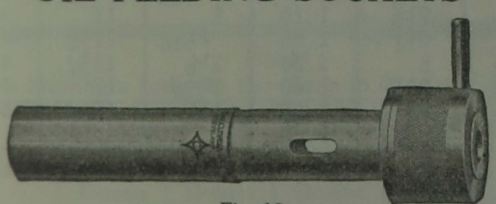

Fig. 13

A constant stream of oil is carried to the cutting lips of the drill and prevents its heating or sticking in the hole. The drills can be run at a much higher speed, and require sharpening less frequently.

The oil is conveyed through channels, in the collar and in the body of the socket, into the orifices in the shank of the drill and so through the tubes of the drill to the point.

NO. 92 A Rough Shanks		NO. 92 B Fitted Shanks					
Hole Nos.	Each	Hole Nos.	Shank Nos.	Each	Hole Nos.	Shank Nos.	Each
1	$4.00	1	2 or 3	$4.50	1	4	$5.25
2	5.00	2	3	5.50	1	5	8.50
3	6.50	3	4	7.00	2	4	6.75
4	9.25	4	5	10.00	2	5	9.00
5	10.25	5	6	14.50	3	5	9.50

OIL TUBE DRILLS

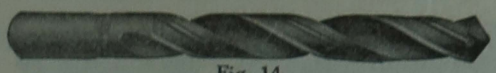

Fig. 14

STRAIGHT SHANK

The oil is fed through the shank of these drills, which is bored for the purpose, and so through the tubes to the point of the drill. The constant stream of oil at the cutting lips prevents the drill from heating or sticking in the hole and allows running at a much higher speed with less frequent sharpening.

Air is sometimes used for cooling, particularly when drilling cast iron, and for blowing out chips.

Boring machines on which these round shank drills are used must have a hollow spindle and connection for allowing lubricant to feed to drill. No special socket is necessary.

NO. 99—CARBON STEEL
NO. 429—HIGH SPEED STEEL

Diam., Inches	9 Inches Over All		12 Inches Over All	
	Carbon Steel, Each	High Speed, Each	Carbon Steel, Each	High Speed, Each
5/8	$2.70	$6.50	$3.30	$8.00
21/32	2.80	6.65	3.40	8.15
11/16	2.90	6.75	3.50	8.25
23/32	3.00	6.90	3.60	8.50
3/4	3.10	7.00	3.70	8.75
25/32	3.20	7.25	3.80	9.00
13/16	3.30	7.50	3.90	9.25
27/32	3.40	7.90	4.00	9.65
7/8	3.50	8.25	4.10	10.00
29/32	3.60	8.65	4.25	10.40
15/16	3.75	9.00	4.45	10.75
31/32	3.90	9.40	4.65	11.15
1	4.10	9.75	4.85	11.50
1 1/32	4.30	10.15	5.05	12.00
1 1/16	4.45	10.50	5.25	12.50
1 3/32	4.60	10.90	5.50	13.00
1 1/8	4.75	11.25	5.75	13.50
1 5/32	4.95	11.65	6.00	14.00
1 3/16	5.15	12.00	6.25	14.50
1 7/32	5.35	12.40	6.50	15.00
1 1/4	5.65	12.75	6.75	15.50
1 9/32	5.95	13.15	7.00	16.00
1 5/16	6.25	13.50	7.25	16.50
1 11/32	6.55	13.90	7.50	17.00
1 3/8	6.85	14.25	8.00	17.50
1 13/32	7.15	14.75	8.50	18.15
1 7/16	7.50	15.25	9.00	18.75
1 15/32	7.85	15.90	9.50	19.50
1 1/2	8.25	16.50	10.00	20.25

Diam., Inches	14 Inches Over All		Diam., Inches	16 Inches Over All	
	Carbon Steel, Each	High Speed, Each		Carbon Steel, Each	High Speed, Each
1 17/32	$11.50	.....	1 25/32	$15.50	.....
1 9/16	11.90	$25.75	1 13/16	16.00	$41.00
1 19/32	12.25	.....	1 27/32	16.50	.....
1 5/8	12.65	28.00	1 7/8	17.00	44.00
1 21/32	13.00	.....	1 29/32	17.50	.....
1 11/16	13.35	30.25	1 15/16	18.00	47.00
1 23/32	13.70	.....	1 31/32	18.50	.....
1 3/4	14.00	32.50	2	19.00	50.00

Drills 9 Inches over all have flutes 7 Inches long.
Drills 12 Inches over all have flutes 10 Inches long.
Drills 14 Inches over all have flutes 12 Inches long.
Drills 16 Inches over all have flutes 14 Inches long.

High Speed Steel Drills from 1/2 to 1 1/2 Inch by 32nds and from 1 1/16 to 2 inch by 16ths are regular in all lengths.

THREE FLUTED DRILLS

Fig. 15

Taper Shank

NO. 12—CARBON STEEL
NO. 407—HIGH SPEED STEEL

Fig. 16

Straight Shank

NO. 24—CARBON STEEL
NO. 409—HIGH SPEED STEEL

Especially adapted for enlarging cored, punched or drilled holes. They will not drill the initial hole.

STRAIGHT OR TAPER SHANK

Diameter, Ins.	Length Over All, Ins.	Each		Diameter, Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/4	6 1/8	$1.00	$2.00	113/32	14 5/8	$7.00	$17.75
9/32	6 1/4	1.05	2.15	17/16	14 3/4	7.50	18.50
5/16	6 3/8	1.10	2.25	115/32	14 7/8	8.00	19.25
11/32	6 1/2	1.15	2.40	1 1/2	15	8.50	20.00
3/8	6 3/4	1.20	2.50	117/32	15 1/8	9.00	20.75
13/32	7	1.25	2.65	1 9/16	15 1/4	9.50	21.50
7/16	7 1/4	1.30	2.75	119/32	15 3/8	10.00	22.25
15/32	7 1/2	1.40	2.90	1 5/8	15 1/2	10.50	23.00
1/2	7 3/4	1.50	3.00	121/32	15 5/8	11.00	23.75
17/32	8	1.60	3.15	111/16	15 3/4	11.50	24.50
9/16	8 1/4	1.70	3.25	123/32	15 7/8	12.00	25.50
19/32	8 1/2	1.80	3.50	1 3/4	16	12.50	26.50
5/8	8 3/4	1.90	3.75	125/32	16 1/8	13.25	27.50
21/32	9	2.00	4.00	113/16	16 1/4	14.00	28.50
11/16	9 1/4	2.10	4.25	127/32	16 3/8	14.75	29.50
23/32	9 1/2	2.25	4.65	1 7/8	16 1/2	15.50	30.50
3/4	9 3/4	2.40	5.00	129/32	16 1/2	16.25	31.50
25/32	9 7/8	2.55	5.40	115/16	16 1/2	17.00	32.50
13/16	10	2.70	5.75	131/32	16 1/2	17.75	33.50
27/32	10 1/4	2.85	6.15	2	16 1/2	18.50	34.50
7/8	10 1/2	3.00	6.50	21/32	16 1/2	19.25	36.00
29/32	10 5/8	3.15	7.00	21/16	17	20.00	37.50
15/16	10 3/4	3.30	7.50	2 1/8	17	21.50	40.50
31/32	10 7/8	3.45	8.00	23/16	17	23.00	43.75
1	11	3.60	8.50	2 1/4	17 1/2	24.50	47.50
1 1/32	11 1/8	3.75	9.00	25/16	17 1/2	26.00	52.50
1 1/16	11 1/4	4.00	9.50	2 3/8	18	27.50	60.00
1 3/32	11 1/2	4.25	10.25	27/16	18 1/2	29.00	65.00
1 1/8	11 3/4	4.50	11.00	2 1/2	19	30.50	70.00
1 5/32	11 7/8	4.75	11.75	29/16	19 1/4	32.00	76.25
1 3/16	12	5.00	12.50	2 5/8	19 1/2	34.00	82.50
1 7/32	12 1/8	5.25	13.25	211/16	20	36.00	88.75
1 1/4	12 1/2	5.50	14.00	2 3/4	20 1/2	38.00	95.00
1 9/32	14 1/8	5.75	14.75	213/16	20 1/2	40.50	102.50
1 5/16	14 1/4	6.00	15.50	2 7/8	21	43.00	110.00
1 11/32	14 3/8	6.25	16.25	215/16	21	45.50	117.50
1 3/8	14 1/2	6.50	17.00	3	22	48.00	125.00

List prices and dimensions in above table apply to either straight or taper shank.

TAPER SHANKS ON DRILLS

Diameter Drill, Inches	1/4 to 9/16	19/32 to 29/32	
Taper Shank, Nos.	1	2	
Diameter Drill Inches,	15/16 to 1 1/4	1 9/32 to 2	2 1/32 to 3
Taper Shank, Nos.	3	4	5

MACHINE BITS FOR WOOD

Fig. 17

No. 122—STRAIGHT SHANK

Diameter, Inches	Length Over All, Inches	Each	Diameter, Inches	Length Over All, Inches	Each
1/8	3	$0.40	21/32	6 3/4	$1.60
5/32	3 1/4	.45	11/16	7	1.70
3/16	3 1/2	.50	23/32	7 1/4	1.80
7/32	3 3/4	.55	3/4	7 1/2	1.90
1/4	4	.60	25/32	7 3/4	2.00
9/32	4 1/4	.65	13/16	8	2.10
5/16	4 1/2	.70	27/32	8 1/4	2.30
11/32	4 3/4	.75	7/8	8 1/2	2.50
3/8	5	.80	29/32	8 3/4	2.70
13/32	5 1/4	.85	15/16	9	2.90
7/16	5 1/2	.90	31/32	9 1/4	3.00
15/32	5 3/4	1.00	1	9 1/2	3.25
1/2	6	1.10	1 1/16	11 1/4	3.75
17/32	6 1/8	1.20	1 1/8	11 3/4	4.25
9/16	6 1/4	1.30	1 3/16	12	4.75
19/32	6 3/8	1.40	1 1/4	12 1/2	5.25
5/8	6 1/2	1.50			

Fig. 18

NO. 122A—1/2-INCH SHANKS
For Blacksmiths' Drill Presses

Diameter, Inches	Length Over All, Inches	Each	Diameter, Inches	Length Over All, Inches	Each
1/8	4 5/8	$0.50	21/32	9	$1.70
5/32	4 7/8	.55	11/16	9 1/4	1.80
3/16	5	.60	23/32	9 1/2	1.90
7/32	5 1/4	.65	3/4	9 3/4	2.00
1/4	6 1/8	.70	25/32	9 7/8	2.10
9/32	6 1/4	.75	13/16	10	2.20
5/16	6 3/8	.80	27/32	10 1/4	2.40
11/32	6 1/2	.85	7/8	10 1/2	2.60
3/8	6 3/4	.90	29/32	10 5/8	2.80
13/32	7	.95	15/16	10 3/4	3.00
7/16	7 1/4	1.00	31/32	10 7/8	3.25
15/32	7 1/2	1.10	1	11	3.50
1/2	7 3/4	1.20	1 1/16	11 1/4	4.00
17/32	8	1.30	1 1/8	11 3/4	4.50
9/16	8 1/4	1.40	1 3/16	12	5.00
19/32	8 1/2	1.50	1 1/4	12 1/2	5.50
5/8	8 3/4	1.60			

The above drills have shanks 1/2 inch in diameter and 2 1/2 inches long.

COOPERS' DOWEL DRILLS

Fig. 19

NO. 113

Diameter, Inches	Length Over All, Inches	Per Dozen	Diameter, Inches	Length Over All, Inches	Per Dozen
1/8	2 1/2	$1.50	1/2	4 1/2	$7.00
3/16	2 3/4	2.00	9/16	4 3/4	8.50
1/4	3	3.00	5/8	5	10.50
5/16	3 1/4	4.00	11/16	5 1/2	12.50
3/8	3 3/4	5.00	3/4	6	15.00
7/16	4	6.00			

SQUARE SHANK TWIST DRILLS
RATCHET

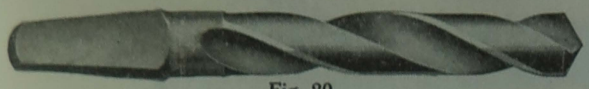

Fig. 20

NO. 111—CARBON STEEL
NO. 414—HIGH SPEED STEEL

Dia., Ins.	Length Over All, Ins.	Each		Dia., Ins.	Length Over All, Ins.	Each	
		Carbon Steel	High Speed			Carbon Steel	High Speed
1/8	4 1/2	$0.90	$2.30	31/32	8	$2.40	$5.25
5/32	4 1/2	.95	2.35	1	8 1/2	2.55	5.50
3/16	4 1/2	.95	2.40	1 1/32	8 1/2	2.70	5.75
7/32	5	1.00	2.45	1 1/16	8 1/2	2.85	6.00
1/4	5	1.00	2.50	1 3/32	8 1/2	3.00	6.30
9/32	5	1.05	2.55	1 1/8	9	3.10	6.70
5/16	5	1.10	2.60	1 5/32	9	3.25	7.00
11/32	5	1.15	2.65	1 3/16	9	3.35	7.30
3/8	6	1.20	2.70	1 7/32	9	3.50	7.60
13/32	6 1/4	1.25	2.75	1 1/4	9	3.65	7.90
7/16	6 1/4	1.25	2.80	1 9/32	9	3.75	8.25
15/32	6 1/4	1.30	2.85	1 5/16	9	3.90	8.60
1/2	6 1/2	1.30	2.90	1 11/32	9	4.05	9.00
17/32	6 1/2	1.35	2.95	1 3/8	9	4.20	9.40
9/16	6 1/2	1.35	3.00	1 13/32	9	4.35	9.80
19/32	6 1/2	1.40	3.10	1 7/16	9	4.50	10.20
5/8	6 1/2	1.40	3.20	1 15/32	9	4.65	10.60
21/32	6 1/2	1.45	3.30	1 1/2	9	4.80	11.00
11/16	6 1/2	1.45	3.40	1 9/16	9	5.10	12.50
23/32	6 1/2	1.50	3.50	1 5/8	9	5.40	14.00
3/4	6 1/2	1.55	3.65	1 11/16	9	5.75	15.50
25/32	6 1/2	1.65	3.80	1 3/4	9	6.10	17.00
13/16	7	1.75	4.00	1 13/16	9	6.50	18.50
27/32	7	1.90	4.20	1 7/8	9	6.90	20.50
7/8	7 1/2	2.05	4.50	1 15/16	9	7.30	22.50
29/32	7 1/2	2.20	4.70	2	9	7.75	25.00
15/16	8	2.30	5.00				

No. 1 Shanks—3/8 Inch by 5/8 Inch by 1 1/2 Inches long.
No. 2 Shanks—1/2 Inch by 3/4 Inch by 1 3/4 Inches long.
Unless otherwise specified No. 1 Shank will be furnished, except on High Speed Drills over 1 Inch, which will be equipped with No. 2 Shank.

ELECTRICIANS OR BELL HANGERS BITS

Fig. 21

The Numbers Indicate the Sizes in 32nds of an Inch

NOS.	12-Inch	18-Inch	24-Inch	30-Inch	36-Inch
	Per Dozen	Per Dozen	Per Dozen	Per Dozen	Per Dozen
6	$7.50	$10.00	$12.50	$15.00	$17.50
8	8.00	10.50	13.00	15.50	18.00
10	8.75	11.00	13.50	16.00	18.50
12	9.50	12.00	14.50	17.00	19.50
14	10.50	13.00	15.50	18.00	20.50
16	12.00	14.50	17.00	19.50	22.00
18	13.50	16.00	18.50	21.00	23.50
20	15.25	17.75	20.25	22.75	25.25
22	17.00	19.50	22.00	24.50	27.00
24	19.00	21.50	24.00	26.50	29.00
26	21.00	23.50	26.00	28.50	31.00
28	23.00	25.50	28.00	30.50	33.00
30	25.00	27.50	30.00	32.50	35.00
32	27.50	30.00	32.50	35.50	38.00
34	30.50	33.00	35.50	39.00	42.00
36	33.00	36.00	39.00	42.50	47.00

Long Shank Bits designed for use of electricians in wiring. Twist is accurate and is long enough to hold a straight course through a long bore.

WOOD BITS FOR BRACE

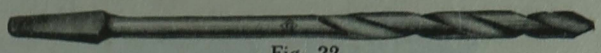

Fig. 22

NO. 114A

Size, Inches	Per Dozen	Size, Inches	Per Dozen	Size, Inches	Per Dozen
2/32	$3.25	11/32	$6.50	19/32	$11.75
3/32	3.25	12/32	7.00	20/32	12.50
4/32	3.25	13/32	7.50	22/32	14.50
5/32	3.50	14/32	8.00	24/32	16.50
6/32	4.00	15/32	8.75	26/32	18.50
7/32	4.50	16/32	9.50	28/32	21.00
8/32	5.00	17/32	10.25	30/32	24.00
9/32	5.50	18/32	11.00	32/32	27.00
10/32	6.00				

Sizes 1/16 to 3/8 Inch inclusive, packed one dozen to a box.

TWIST DRILLS IN SETS

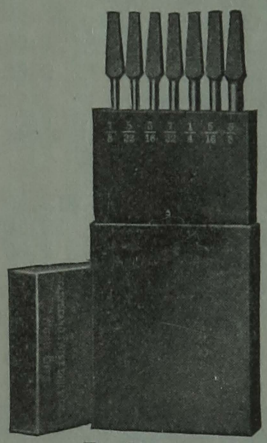

Fig. 23

FOR WOOD
With Bit Stock for Brace.

Set of 7 Drills contained in a finely finished flat case with a covering of dark green corduroy silk, embossed in gold. Size of Case 8 3/4x3 1/2x3/4 Inches.

NO. 13B—Sizes of Wood Drills, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16 and 3/8 Inches.
Per Set..... $3.70

FOR WOOD OR METAL
With Bit Stock for Brace

Set of 7 Bit Stock Drills in a flat case, covered with strong leatherette, green in color and embossed in gold. Size of Case 7x3 1/2x3/4 Inches.

Per Set

NO. 14B—Sizes of Bit Stock Drills, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16 and 3/8 Inch..... **$4.35**

Fig. 24

IN ROUND SCREW TOP WOOD BOXES
WOOD DRILLS

With Bit Stock for Brace **Per Set**

NO. 13A—Box, 2 1/2 Inches in diameter and 8 3/4 Inches long; contains 9 sizes of Wood Drills, 1/16, 3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16 and 3/8 Inch..... **$4.00**

Bit Stock Drills for Metal or Wood

NO. 13—Box, 2 1/2 Inches in Diameter and 6 1/2 Inches long; contains 9 sizes of Bit Stock Drills, 1/16, 3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 5/16 and 3/8 Inch **4.25**

TWIST DRILLS IN SETS

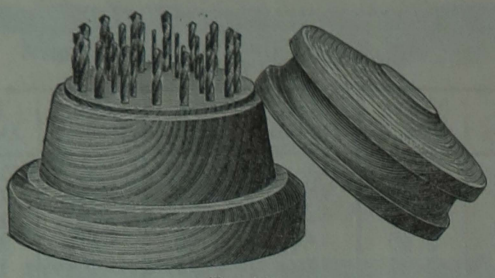

Fig. 25

Set of 36 Drills in a mahogany case with cap. Nos. 30, 1/8 Inch, to No. 65 Wire Gauge.

NO.	10
Diameter Bottom of Case, Inches	2½
Height Case, Inches	2½
Weight per Set, complete, Lbs	3/8
Per Set with Case	**$8.00**
Per Set without Case	**6.00**
Case only	**2.00**

MOUNTED ON MAPLE BLOCKS

Per Set

NO. 5—29 Short Set Straight Shank Drills, 1/16 to 1/2 by 64ths.
Mounted on Maple Block $13.50
Drills only, not Mounted 12.50
Maple Block only 1.00

NO. 6—15 Short Set Straight Shank Drills, 1/16 to 1/2 by 32nds.
Mounted on Maple Block $8.00
Drills only, not Mounted 7.00
Maple Block only 1.00

NO. 7—65 Drills; Wire Gauge Straight Shank Nos. 1 to 60 and Short Set Straight Shank Sizes 1/4 to 3/8 by 32nds.
Mounted on Maple Block $14.50
Drills only, not Mounted 13.25
Maple Block only 1.25

NO. 8—60 Wire Gauge Drills Nos. 1 to 60.
Mounted on Maple Block $12.50
Drills only, not Mounted 11.25
Maple Block only 1.25

NO. 9—30 Wire Gauge Straight Shank Drills, Alternate Nos. 1 to 59.
Mounted on Maple Block $7.00
Drills only, not Mounted 6.00
Maple Block only 1.00

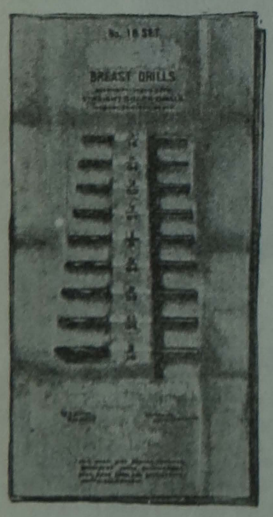

Fig. 26

POCKET PACKAGE

Designed particularly for the autoist or garage-man; made of tough non-tearing fiber and rolls into a snug flat package.

Contains 9 straight sizes of straight shank Drills, each size plainly marked.

Per Set, Complete $1.60

TWIST DRILLS IN SETS

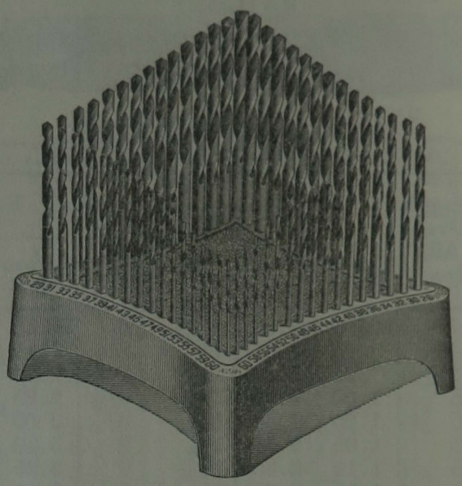

Fig. 27

MOUNTED ON METAL STAND

Set Comprises all the sizes of jobbers straight shank Drills from 1/16 to 1/2 Inch, inclusive, by 64ths. Each Drill fits in a hole plainly marked with its size. 32nd sizes on one side and 64th sizes on the opposite side makes selection easy. Stand is 5 Inches Square and 1½ Inches High.

Per Set

NO. 50—Carbon Steel Drills; weight, complete with Stand, 4 Lbs. $15.00
NO. 54—High Speed Steel Drills without Stand $26.20
Stand only $2.40

Set comprises all sizes of wire gauge straight shank Drills Nos. 1 to 60. Each drill fits in a hole plainly marked with its size. Even Nos. on one side and odd Nos. on the other side makes selection easy. Stand is 5 Inches Square and 1½ Inches High.

Per Set

NO. 80—Carbon Steel Drills; weight, complete with Stand, 4 Lbs. $13.25
NO. 84—High Speed Drills only without Stand $30.60
Stand only $2.40

Millimeter Sizes

Per Set

NO. 60—Set comprises short set straight shank Drills from 1 m/m to 6.5 m/m by .1 m/m, mounted on metal stand. Weight per Set, complete, 4 Lbs. $13.50

WHEELWRIGHT'S

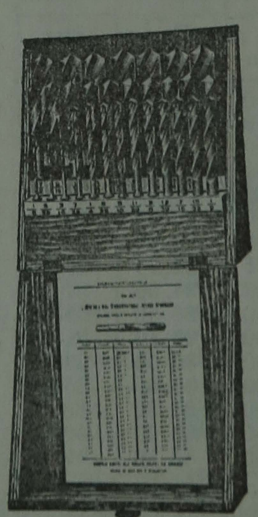

Fig. 28

Wood Cases with holes for each size plainly marked; can be set on shelf or screwed to a post or to the wall.

NO. 43½A—Holds 12 ½-Inch Shank Drills, from 3/16 to 17/32 by 32nds.
Case only $1.25
Drills only $9.30

NO. 43½B—Holds 12 ½-Inch Shank Drills, from 5/32 to 27/32 by 32nds.
Case only $1.25
Drills only $13.25

NO. 43½C—Holds 30 ½-Inch Shank Drills, from 1/8 to 1 1/32 Inches by 32nds.
Case only $1.50
Drills only $39.80

HAND REAMERS

ECCENTRIC FLUTES

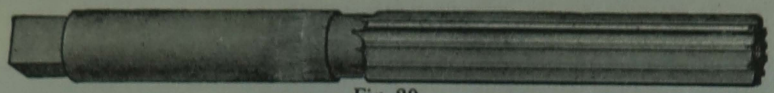

Fig. 29

NO. 128A—CARBON STEEL

Dia. Ins.	Lgth. Flute, Ins.	Lgth. Over All, Ins.	Each Carbon Steel	Each High Speed
1/8	1 1/2	3	$1.00	$3.00
9/64	1 5/8	3 1/4	1.10	3.25
5/32	1 5/8	3 1/4	1.10	3.25
11/64	1 3/4	3 1/2	1.20	3.25
3/16	1 3/4	3 1/2	1.20	3.25
13/64	1 7/8	3 3/4	1.30	3.50
7/32	1 7/8	3 3/4	1.30	3.50
15/64	2	4	1.40	3.50
1/4	2	4	1.40	3.50
17/64	2 1/8	4 1/4	1.45	3.75
9/32	2 1/8	4 1/4	1.45	3.75
19/64	2 1/4	4 1/2	1.50	3.75
5/16	2 1/4	4 1/2	1.50	3.75
21/64	2 3/8	4 3/4	1.55	4.25
11/32	2 3/8	4 3/4	1.55	4.25
23/64	2 1/2	5	1.60	4.25
3/8	2 1/2	5	1.60	4.25
25/64	2 5/8	5 1/4	1.70	4.75
13/32	2 5/8	5 1/4	1.70	4.75
27/64	2 3/4	5 1/2	1.75	4.75
7/16	2 3/4	5 1/2	1.75	4.75
29/64	2 7/8	5 3/4	1.85	5.25
15/32	2 7/8	5 3/4	1.85	5.25
31/64	3	6	1.90	5.25
1/2	3	6	1.90	5.25
17/32	3 1/8	6 1/4	1.95	5.75
9/16	3 1/4	6 1/2	2.00	5.75
19/32	3 3/8	6 3/4	2.10	6.25
5/8	3 1/2	7	2.20	6.25
21/32	3 43/64	7 11/32	2.30	6.75
11/16	3 27/32	7 11/16	2.40	6.75
23/32	4 1/16	8 1/8	2.50	7.25
3/4	4 3/16	8 3/8	2.60	7.25
25/32	4 23/64	8 23/32	2.70	7.75
13/16	4 17/32	9 1/16	2.80	7.75
27/32	4 11/16	9 3/8	2.95	8.50
7/8	4 27/32	9 11/16	3.10	8.50
29/32	5 3/64	10 3/32	3.25	9.50
15/16	5 1/8	10 1/4	3.40	9.50
31/32	5 11/32	10 11/16	3.55	10.50
1	5 7/16	10 7/8	3.70	10.50
1 1/32	5 17/32	11 1/16	3.85	11.50
1 1/16	5 5/8	11 1/4	4.00	11.50
1 3/32	5 23/32	11 7/16	4.15	12.75

No. 624—HIGH SPEED STEEL

Dia., Ins.	Lgth. Flute, Ins.	Lgth. Over All, Ins.	Each Carbon Steel	Each High Speed
1 1/8	5 13/16	11 5/8	$4.30	$12.75
1 5/32	5 29/32	11 13/16	4.45	14.25
1 3/16	6	12	4.60	14.25
1 7/32	6 1/16	12 1/8	4.75	15.75
1 1/4	6 1/8	12 1/4	4.90	15.75
1 9/32	6 11/64	12 11/32	5.05	17.25
1 5/16	6 7/32	12 7/16	5.20	17.25
1 11/32	6 17/64	12 17/32	5.40	18.75
1 3/8	6 5/16	12 5/8	5.60	18.75
1 13/32	6 23/64	12 23/32	5.80	20.50
1 7/16	6 13/32	12 13/16	6.00	20.50
1 15/32	6 29/64	12 29/32	6.20	22.25
1 1/2	6 1/2	13	6.40	22.25
1 17/32	6 1/2	13	6.60	24.00
1 9/16	6 1/2	13	6.80	24.00
1 19/32	6 1/2	13	7.00	25.75
1 5/8	6 1/2	13	7.20	25.75
1 21/32	6 3/4	13 1/2	7.40	27.50
1 11/16	6 3/4	13 1/2	7.60	27.50
1 23/32	6 3/4	13 1/2	7.80	29.50
1 3/4	6 3/4	13 1/2	8.00	29.50
1 25/32	6 3/4	13 1/2	8.20	31.50
1 13/16	6 3/4	13 1/2	8.40	31.50
1 27/32	6 3/4	13 1/2	8.60	33.50
1 7/8	7	14	8.80	33.50
1 29/32	7	14	9.00	35.75
1 15/16	7	14	9.20	35.75
1 31/32	7	14	9.40	38.00
2	7	14	9.60	38.00
2 1/16	7 1/4	14 1/2	10.00	40.75
2 1/8	7 1/4	14 1/2	10.40	43.50
2 3/16	7 1/2	15	10.80	46.25
2 1/4	7 1/2	15	11.30	49.00
2 5/16	7 1/2	15	11.80	51.75
2 3/8	7 1/2	15	12.30	55.00
2 7/16	7 3/4	15 1/2	12.80	58.25
2 1/2	7 3/4	15 1/2	13.40	61.50
2 9/16	7 3/4	15 1/2	14.00	64.75
2 5/8	8	16	14.60	68.00
2 11/16	8	16	15.40	71.25
2 3/4	8	16	16.20	74.50
2 13/16	8 1/4	16 1/2	17.00	77.75
2 7/8	8 1/4	16 1/2	17.80	81.00
2 15/16	8 1/4	16 1/2	18.60	84.25
3	8 1/4	16 1/2	19.40	87.50

TAPER SHANK REAMERS

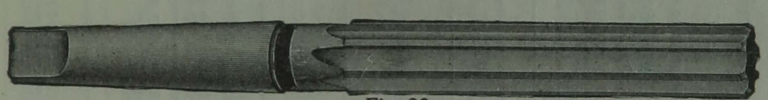

Fig. 30

JOBBERS'—TAPER SHANK

No. 128B—CARBON STEEL

Dia., Ins.	Length Flute, Ins.	Length Over All, Ins.	Each Carbon Steel	Each High Speed
1/4	2	5 3/16	$1.70	$4.00
17/64	2	5 3/16	1.75	4.25
9/32	2	5 3/16	1.75	4.25
19/64	2 1/4	5 1/2	1.80	4.25
5/16	2 1/4	5 1/2	1.80	4.25
21/64	2 1/4	5 1/2	1.85	4.75
11/32	2 1/4	5 1/2	1.85	4.75
23/64	2 1/2	5 13/16	1.90	4.75
3/8	2 1/2	5 13/16	1.90	4.75
25/64	2 1/2	5 13/16	2.05	5.25
13/32	2 1/2	5 13/16	2.05	5.25
27/64	2 3/4	6 1/8	2.15	5.25
7/16	2 3/4	6 1/8	2.15	5.25
29/64	2 3/4	6 1/8	2.20	5.75
15/32	2 3/4	6 1/8	2.20	5.75
31/64	3	6 7/16	2.30	5.75
1/2	3	6 7/16	2.30	5.75
17/32	3	6 7/16	2.35	6.25
9/16	3 1/4	6 3/4	2.40	6.25
19/32	3 1/4	6 3/4	2.50	6.75
5/8	3 1/2	7 9/16	2.65	6.75
21/32	3 1/2	7 9/16	2.75	7.25
11/16	3 7/8	8	2.90	7.25
23/32	3 7/8	8	3.00	7.75
3/4	4 3/16	8 3/8	3.10	7.75
25/32	4 3/16	8 3/8	3.25	8.50
13/16	4 9/16	8 13/16	3.35	8.50
27/32	4 9/16	8 13/16	3.55	9.50
7/8	4 7/8	9 3/16	3.70	9.50
29/32	4 7/8	9 3/16	3.90	10.50
15/16	5 1/8	10	4.10	10.50
31/32	5 1/8	10	4.25	11.50
1	5 7/16	10 3/8	4.45	11.50
1 1/32	5 7/16	10 3/8	4.60	12.50
1 1/16	5 5/8	10 5/8	4.80	12.50
1 3/32	5 5/8	10 5/8	5.00	13.75
1 1/8	5 13/16	10 7/8	5.15	13.75
1 5/32	5 13/16	10 7/8	5.35	15.25
1 3/16	6	11 1/8	5.50	15.25
1 7/32	6	11 1/8	5.70	16.75
1 1/4	6 1/8	12 1/2	5.90	16.75
1 9/32	6 1/8	12 1/2	6.05	18.25
1 5/16	6 1/4	12 11/16	6.25	18.25
1 11/32	6 1/4	12 11/16	6.50	19.75

No. 628—HIGH SPEED STEEL

Dia., Ins.	Length Flute, Ins.	Length Over All, Ins.	Each Carbon Steel	Each High Speed
1 3/8	6 5/16	12 13/16	$6.70	$19.75
1 13/32	6 5/16	12 13/16	6.95	21.50
1 7/16	6 7/16	13	7.20	21.50
1 15/32	6 7/16	13	7.45	23.25
1 1/2	6 1/2	13 1/8	7.70	23.25
1 17/32	6 1/2	13 1/8	7.90	25.00
1 9/16	6 1/2	13 1/8	8.15	25.00
1 19/32	6 1/2	13 1/8	8.40	26.75
1 5/8	6 1/2	13 1/8	8.65	26.75
1 21/32	6 1/2	13 1/8	8.90	28.50
1 11/16	6 3/4	13 3/8	9.10	28.50
1 23/32	6 3/4	13 3/8	9.35	30.50
1 3/4	6 3/4	14 11/16	9.60	30.50
1 25/32	6 3/4	14 11/16	9.85	32.50
1 13/16	6 3/4	14 11/16	10.10	32.50
1 27/32	6 3/4	14 11/16	10.30	34.50
1 7/8	7	15	10.55	34.50
1 29/32	7	15	10.80	36.75
1 15/16	7	15	11.05	36.75
1 31/32	7	15	11.30	39.00
2	7	15	11.50	39.00

TAPER SHANKS ON REAMERS

Diameter Reamers, Inches	1/4 to 1 9/32	5/8 to 2 9/32	15/16 to 1 7/32	1 1/4 to 1 23/32	1 3/4 to 2
Taper Shank Nos.	1	2	3	4	5

High Speed Reamers No. 624 and No. 628 are not carried in stock regularly.
Reamers for Brass or Bronze require special clearance and are so furnished on request.
All sizes and dimensions not listed are special and subject to special prices.

FLUTED SHELL REAMERS

ECCENTRIC FLUTES

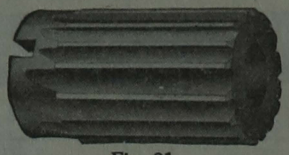

Fig. 31

NO. 130A—CARBON STEEL NO. 620—HIGH SPEED STEEL

Dia., Ins.	Size Hole, Ins.	Length Over All, Ins.	Fits Arbor No.	Carbon Steel, Each	Dia., Ins.	Size Hole, Ins.	Length Over All, Ins.	Fits Arbor No.	Carbon Steel, Each	Dia., Ins.	Size Hole, Ins.	Length Over All, Ins.	Fits Arbor No.	Carbon Steel, Each
1/2	1/4	2	3	$1.70	1 17/32	3/4	3	7	$4.55	3 1/8	1 3/4	4 1/2	11	$13.60
17/32	1/4	2	3	1.80	1 9/16	3/4	3	7	4.55	3 3/16	1 3/4	4 1/2	11	14.10
9/16	1/4	2	3	1.80	1 19/32	3/4	3	7	4.80	3 1/4	1 3/4	4 1/2	11	14.60
19/32	1/4	2	3	1.90	1 5/8	3/4	3	7	4.80	3 5/16	1 3/4	4 1/2	11	15.10
5/8	1/4	2	3	1.90	1 21/32	1	3 1/2	8	5.10	3 3/8	1 3/4	4 1/2	11	15.60
21/32	3/8	2 1/4	4	2.00	1 11/16	1	3 1/2	8	5.10	3 7/16	1 3/4	4 1/2	11	16.10
11/16	3/8	2 1/4	4	2.00	1 23/32	1	3 1/2	8	5.40	3 1/2	1 3/4	4 1/2	11	16.60
23/32	3/8	2 1/4	4	2.10	1 3/4	1	3 1/2	8	5.40	3 9/16	2	5	12	17.20
3/4	3/8	2 1/4	4	2.10	1 25/32	1	3 1/2	8	5.70	3 5/8	2	5	12	17.80
25/32	1/2	2 1/2	5	2.20	1 13/16	1	3 1/2	8	5.70	3 11/16	2	5	12	18.40
13/16	1/2	2 1/2	5	2.20	1 27/32	1	3 1/2	8	6.00	3 3/4	2	5	12	19.00
27/32	1/2	2 1/2	5	2.30	1 7/8	1	3 1/2	8	6.00	3 13/16	2	5	12	19.60
7/8	1/2	2 1/2	5	2.30	1 29/32	1	3 1/2	8	6.30	3 7/8	2	5	12	20.20
29/32	1/2	2 1/2	5	2.40	1 15/16	1	3 1/2	8	6.30	3 15/16	2	5	12	20.80
15/16	1/2	2 1/2	5	2.40	1 31/32	1	3 1/2	8	6.60	4	2	5	12	21.40
31/32	1/2	2 1/2	5	2.50	2	1	3 1/2	8	6.60	4 1/8	2 1/4	5 1/2	13	22.90
1	1/2	2 1/2	5	2.50	2 1/16	1 1/4	3 3/4	9	6.95	4 1/4	2 1/4	5 1/2	13	24.40
1 1/32	5/8	2 3/4	6	2.70	2 1/8	1 1/4	3 3/4	9	7.30	4 3/8	2 1/4	5 1/2	13	25.90
1 1/16	5/8	2 3/4	6	2.70	2 3/16	1 1/4	3 3/4	9	7.65	4 1/2	2 1/4	5 1/2	13	27.40
1 3/32	5/8	2 3/4	6	2.90	2 1/4	1 1/4	3 3/4	9	8.00	4 5/8	2 1/2	6	14	29.30
1 1/8	5/8	2 3/4	6	2.90	2 5/16	1 1/4	3 3/4	9	8.35	4 3/4	2 1/2	6	14	31.20
1 5/32	5/8	2 3/4	6	3.10	2 3/8	1 1/4	3 3/4	9	8.70	4 7/8	2 1/2	6	14	33.10
1 3/16	5/8	2 3/4	6	3.10	2 7/16	1 1/4	3 3/4	9	9.05	5	2 1/2	6	14	35.00
1 7/32	5/8	2 3/4	6	3.30	2 1/2	1 1/4	3 3/4	9	9.40	5 1/8	2 1/2	6	14	37.40
1 1/4	5/8	2 3/4	6	3.30	2 9/16	1 1/2	4	10	9.80	5 1/4	2 1/2	6	14	39.80
1 9/32	3/4	3	7	3.55	2 5/8	1 1/2	4	10	10.20	5 3/8	2 1/2	6	14	42.20
1 5/16	3/4	3	7	3.55	2 11/16	1 1/2	4	10	10.60	5 1/2	2 1/2	6	14	44.60
1 11/32	3/4	3	7	3.80	2 3/4	1 1/2	4	10	11.00	5 5/8	2 3/4	6 1/2	15	47.60
1 3/8	3/4	3	7	3.80	2 13/16	1 1/2	4	10	11.40	5 3/4	2 3/4	6 1/2	15	50.60
1 13/32	3/4	3	7	4.05	2 7/8	1 1/2	4	10	11.80	5 7/8	2 3/4	6 1/2	15	53.60
1 7/16	3/4	3	7	4.05	2 15/16	1 1/2	4	10	12.20	6	2 3/4	6 1/2	15	56.60
1 15/32	3/4	3	7	4.30	3	1 1/2	4	10	12.60					
1 1/2	3/4	3	7	4.30	3 1/16	1 3/4	4 1/2	11	13.10					

Shell Reamers have taper holes. Diameter given is Large End. Prices on High Speed Steel on Application.

ARBORS FOR SHELL REAMERS AND SHELL DRILLS

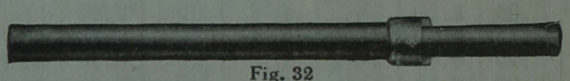

Fig. 32

NO. 133—STRAIGHT SHANK

NO. 133A—TAPER SHANK

Size, Nos.	Fitting Sizes, Inches	Length Over All, Inches	Taper Shank, Nos.	Straight Shank, Each	Taper Shank, Each
3	1/2 to 5/8	8	1	$2.40	$2.90
4	41/64 to 3/4	9	2	2.70	3.25
5	49/64 to 1	9 1/2	2	3.00	3.60
6	1 1/64 to 1 1/4	10	3	3.30	3.95
7	1 17/64 to 1 5/8	11	3	3.60	4.30
8	1 41/64 to 2	12	4	4.00	4.80
9	2 1/64 to 2 1/2	13	4	4.50	5.40
10	2 33/64 to 3	14	5	5.25	6.30
11	3 1/64 to 3 1/2	15	5	7.50	9.00
12	3 33/64 to 4	16	5	10.50	12.60
13	4 1/64 to 4 1/2	17	5	13.50	16.20
14	4 33/64 to 5 1/2	18	5	18.00	21.60
15	5 33/64 to 6	19	6	22.00	26.40

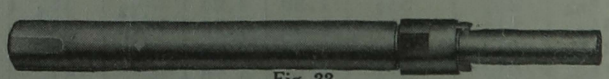

Fig. 33

NO. 78—STRAIGHT SHANK

NO. 79—TAPER SHANK

With Sliding Collar and Adjusting Nut to force off Tool.

Size, Nos.	Fitting Sizes, Inches	Length Over All, Inches	Taper Shank, No.	Straight Shank, Each	Taper Shank, Each
3	1/2 to 5/8	8	1	$3.60	$4.35
4	41/64 to 3/4	9	2	4.05	4.90
5	49/64 to 1	9 1/2	2	4.50	5.40
6	1 1/64 to 1 1/4	10	3	4.95	5.95
7	1 17/64 to 1 5/8	11	3	5.40	6.45
8	1 41/64 to 2	12	4	6.00	7.20
9	2 1/64 to 2 1/2	13	4	6.75	8.10
10	2 33/64 to 3	14	5	7.90	9.45
11	3 1/64 to 3 1/2	15	5	11.25	13.50
12	3 33/64 to 4	16	5	15.75	18.90
13	4 1/64 to 4 1/2	17	5	20.25	24.30
14	4 33/64 to 5 1/2	18	5	27.00	32.40
15	5 33/64 to 6	19	6	33.00	39.60

FLUTED CHUCKING REAMERS

ECCENTRIC FLUTES

Fig. 35

With Taper Shank

NO. 134A—CARBON STEEL
NO. 632—HIGH SPEED STEEL

Diameter, Inches	Length of Flute, Inches	Length Over All, Inches	Taper Shank, No.	Each	
				Carbon Steel	High Speed
1/4	1 1/2	6	1	$1.45	$3.50
9/32	1 1/2	6	1	1.55	3.75
5/16	1 1/2	6	1	1.55	3.75
11/32	1 1/2	6	1	1.75	4.25
3/8	1 3/4	7	1	1.75	4.25
13/32	1 3/4	7	1	1.90	4.75
7/16	1 3/4	7	1	1.90	4.75
15/32	1 3/4	7	1	2.15	5.25
1/2	2	8	1	2.15	5.25
17/32	2	8	1	2.40	5.75
9/16	2	8	1	2.40	5.75
19/32	2	8	1	2.70	6.25
5/8	2 1/4	9	2	2.70	6.25
21/32	2 1/4	9	2	2.90	6.75
11/16	2 1/4	9	2	2.90	6.75
23/32	2 1/4	9	2	3.05	7.25
3/4	2 1/2	9 1/2	2	3.05	7.25
25/32	2 1/2	9 1/2	2	3.35	8.00
13/16	2 1/2	9 1/2	2	3.35	8.00
27/32	2 1/2	9 1/2	2	3.60	9.00
7/8	2 5/8	10	2	3.60	9.00
29/32	2 5/8	10	2	3.90	10.00
15/16	2 5/8	10	3	3.90	10.00
31/32	2 5/8	10	3	4.15	11.00
1	2 3/4	10 1/2	3	4.15	11.00
1 1/32	2 3/4	10 1/2	3	4.45	12.25
1 1/16	2 3/4	10 1/2	3	4.45	12.25
1 3/32	2 3/4	10 1/2	3	4.70	13.50
1 1/8	2 7/8	11	3	4.70	13.50
1 5/32	2 7/8	11	3	5.00	14.75
1 3/16	2 7/8	11	3	5.00	14.75
1 17/32	2 7/8	11	3	5.20	16.25
1 1/4	3	11 1/2	4	5.20	16.25
1 5/16	3	11 1/2	4	5.50	18.00
1 3/8	3 1/4	12	4	5.75	19.75
1 7/16	3 1/4	12	4	6.05	21.50
1 1/2	3 1/2	12 1/2	4	6.30	23.25
1 9/16	3 1/2	12 1/2	4	6.60	25.00
1 5/8	3 3/4	13	4	6.90	26.75
1 11/16	3 3/4	13	4	7.20	28.50
1 3/4	4	13 1/2	5	7.55	30.50
1 13/16	4	13 1/2	5	7.90	32.50
1 7/8	4 1/4	14	5	8.30	34.50
1 15/16	4 1/4	14	5	8.65	36.75
2	4 1/4	14	5	9.00	39.00

FLUTED CHUCKING REAMERS

ECCENTRIC FLUTES

Fig. 34

With Straight Shank

NO. 134—CARBON STEEL
NO. 630—HIGH SPEED STEEL

Diameter, Inches	Length of Flute, Inches	Length Over All, Inches	Each	
			Carbon Steel	High Speed
1/8	7/8	3 3/4	$0.90	$2.00
5/32	1 1/4	5	.95	2.25
3/16	1 1/4	5	1.00	2.50
7/32	1 1/4	5	1.10	2.75
1/4	1 1/2	6	1.20	3.00
9/32	1 1/2	6	1.30	3.25
5/16	1 1/2	6	1.30	3.25
11/32	1 1/2	6	1.45	3.75
3/8	1 3/4	7	1.45	3.75
13/32	1 3/4	7	1.60	4.25
7/16	1 3/4	7	1.60	4.25
15/32	1 3/4	7	1.80	4.75
1/2	2	8	1.80	4.75
17/32	2	8	2.00	5.25
9/16	2	8	2.00	5.25
19/32	2	8	2.25	5.75
5/8	2 1/4	9	2.25	5.75
21/32	2 1/4	9	2.40	6.25
11/16	2 1/4	9	2.40	6.25
23/32	2 1/4	9	2.55	6.75
3/4	2 1/2	9 1/2	2.55	6.75
25/32	2 1/2	9 1/2	2.80	7.25
13/16	2 1/2	9 1/2	2.80	7.25
27/32	2 1/2	9 1/2	3.00	8.00
7/8	2 5/8	10	3.00	8.00
29/32	2 5/8	10	3.25	9.00
15/16	2 5/8	10	3.25	9.00
31/32	5 5/8	10	3.45	10.00
1	2 3/4	10 1/2	3.45	10.00
1 1/32	2 3/4	10 1/2	3.70	11.25
1 1/16	2 3/4	10 1/2	3.70	11.25
1 3/32	2 3/4	10 1/2	3.90	12.50
1 1/8	2 7/8	11	3.90	12.50
1 5/32	2 7/8	11	4.15	13.75
1 3/16	2 7/8	11	4.15	13.75
1 17/32	2 7/8	11	4.35	15.25
1 1/4	3	11 1/2	4.35	15.25
1 5/16	3	11 1/2	4.60	17.00
1 3/8	3 1/4	12	4.80	18.75
1 7/16	3 1/4	12	5.05	20.50
1 1/2	3 1/2	12 1/2	5.25	22.25
1 9/16	3 1/2	12 1/2	5.50	24.00
1 5/8	3 3/4	13	5.75	25.75
1 11/16	3 3/4	13	6.00	27.50
1 3/4	4	13 1/2	6.30	29.50
1 13/16	4	13 1/2	6.60	31.50
1 7/8	4 1/4	14	6.90	33.50
1 15/16	4 1/4	14	7.20	35.75
2	4 1/4	14	7.50	38.00

High Speed Reamers No. 630 are not carried in stock regularly in sizes 1/2 Inch and larger.
Reamers for brass or bronze require special clearance and are so furnished on request.
All sizes and dimensions not listed are special and subject to special prices.

ROSE CHUCKING REAMERS

Extensively used with plain spindle machines. Useful for enlarging and tracing cored holes run through with three and four fluted or roughing reamers, bottom facing blind holes, etc. Due to shape of cutters, 1/16 inch cuts are easily taken. These reamers have no radial clearance but are ground with a longitudinal clearance. It is only necessary to keep cutting points sharp. Reamers for brass or bronze require special clearance and are so furnished on request.

Fig. 36

With Taper Shank

NO. 151—CARBON STEEL

NO. 636—HIGH SPEED STEEL

Diameter, Inches	Length Flute, Inches	Length Over All, Inches	Taper Shank, No.	Each	
				Carbon Steel	High Speed
1/4	1 1/2	6	1	$1.45	$3.50
9/32	1 1/2	6	1	1.55	3.75
5/16	1 1/2	6	1	1.55	3.75
11/32	1 1/2	6	1	1.75	4.25
3/8	1 3/4	7	1	1.75	4.25
13/32	1 3/4	7	1	1.90	4.75
7/16	1 3/4	7	1	1.90	4.75
15/32	1 3/4	7	1	2.15	5.25
1/2	2	8	1	2.15	5.25
17/32	2	8	1	2.40	5.75
9/16	2	8	1	2.40	5.75
19/32	2	8	1	2.70	6.25
5/8	2 1/4	9	2	2.70	6.25
21/32	2 1/4	9	2	2.90	6.75
11/16	2 1/4	9	2	2.90	6.75
23/32	2 1/4	9	2	3.05	7.25
3/4	2 1/2	9 1/2	2	3.05	7.25
25/32	2 1/2	9 1/2	2	3.35	8.00
13/16	2 1/2	9 1/2	2	3.35	8.00
27/32	2 1/2	9 1/2	2	3.60	9.00
7/8	2 5/8	10	2	3.60	9.00
29/32	2 5/8	10	2	3.90	10.00
15/16	2 5/8	10	3	3.90	10.00
31/32	2 5/8	10	3	4.15	11.00
1	2 3/4	10 1/2	3	4.15	11.00
1 1/32	2 3/4	10 1/2	3	4.45	12.25
1 1/16	2 3/4	10 1/2	3	4.45	12.25
1 3/32	2 3/4	10 1/2	3	4.70	13.50
1 1/8	2 7/8	11	3	4.70	13.50
1 5/32	2 7/8	11	3	5.00	14.75
1 3/16	2 7/8	11	3	5.00	14.75
1 7/32	2 7/8	11	3	5.20	16.25
1 1/4	3	11 1/2	4	5.20	16.25
1 5/16	3	11 1/2	4	5.50	18.00
1 3/8	3 1/4	12	4	5.75	19.75
1 7/16	3 1/4	12	4	6.05	21.50
1 1/2	3 1/2	12 1/2	4	6.30	23.25
1 9/16	3 1/2	12 1/2	4	6.60	25.00
1 5/8	3 3/4	13	4	6.90	26.75
1 11/16	3 3/4	13	4	7.20	28.50
1 3/4	4	13 1/2	5	7.55	30.50
1 13/16	4	13 1/2	5	7.90	32.50
1 7/8	4 1/4	14	5	8.30	34.50
1 15/16	4 1/4	14	5	8.65	36.75
2	4 1/4	14	5	9.00	39.00

High Speed Reamers No. 634 and No. 636 are not carried in stock regularly in sizes 5/8 Inch and larger.

All sizes and dimensions not listed are special and subject to special prices.

Fig. 37

With Straight Shank

NO. 136—CARBON STEEL

NO. 634—HIGH SPEED STEEL

Diameter, Inches	Length Flute, Inches	Length Over All, Inches	Each	
			Carbon Steel	High Speed
1/8	7/8	3 3/4	$0.90	$2.00
5/32	1 1/4	5	.95	2.25
3/16	1 1/4	5	1.00	2.50
7/32	1 1/4	5	1.10	2.75
1/4	1 1/2	6	1.20	3.00
9/32	1 1/2	6	1.30	3.25
5/16	1 1/2	6	1.30	3.25
11/32	1 1/2	6	1.45	3.75
3/8	1 3/4	7	1.45	3.75
13/32	1 3/4	7	1.60	4.25
7/16	1 3/4	7	1.60	4.25
15/32	1 3/4	7	1.80	4.75
1/2	2	8	1.80	4.75
17/32	2	8	2.00	5.25
9/16	2	8	2.00	5.25
19/32	2	8	2.25	5.75
5/8	2 1/4	9	2.25	5.75
21/32	2 1/4	9	2.40	6.25
11/16	2 1/4	9	2.40	6.25
23/32	2 1/4	9	2.55	6.75
3/4	2 1/2	9 1/2	2.55	6.75
25/32	2 1/2	9 1/2	2.80	7.25
13/16	2 1/2	9 1/2	2.80	7.25
27/32	2 1/2	9 1/2	3.00	8.00
7/8	2 5/8	10	3.00	8.00
29/32	2 5/8	10	3.25	9.00
15/16	2 5/8	10	3.25	9.00
31/32	2 5/8	10	3.45	10.00
1	2 3/4	10 1/2	3.45	10.00
1 1/32	2 3/4	10 1/2	3.70	11.25
1 1/16	2 3/4	10 1/2	3.70	11.25
1 3/32	2 3/4	10 1/2	3.90	12.50
1 1/8	2 7/8	11	3.90	12.50
1 5/32	2 7/8	11	4.15	13.75
1 3/16	2 7/8	11	4.15	13.75
1 7/32	2 7/8	11	4.35	15.25
1 1/4	3	11 1/2	4.35	15.25
1 5/16	3	11 1/2	4.60	17.00
1 3/8	3 1/4	12	4.80	18.75
1 7/16	3 1/4	12	5.05	20.50
1 1/2	3 1/2	12 1/2	5.25	22.25
1 9/16	3 1/2	12 1/2	5.50	24.00
1 5/8	3 3/4	13	5.75	25.75
1 11/16	3 3/4	13	6.00	27.50
1 3/4	4	13 1/2	6.30	29.50
1 13/16	4	13 1/2	6.60	31.50
1 7/8	4 1/4	14	6.90	33.50
1 15/16	4 1/4	14	7.20	35.75
2	4 1/4	14	7.50	38.00

Above Reamers can also be furnished to order only with special straight shanks for screw and chucking machines

TAPER BRIDGE REAMERS

Especially designed for severe service and particularly adapted for use in Structural Iron and Steel Boiler Plate, etc., where precision is not absolutely required.

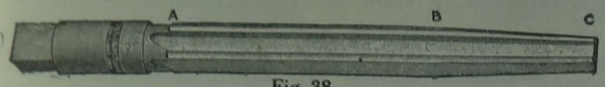

Fig. 38

SQUARE SHANK

NO. 150—CARBON STEEL NO. 614—HIGH SPEED

Diameter, Inches A	Diameter, Inches B	Diameter, Inches C	Length Flute, Inches	Length Over All, Inches	Each Carbon Steel	Each High Speed
1/4	1/4	5/32	3 3/8	4 1/4	$2.30	$2.50
9/32	9/32	11/64	3 3/4	4 3/4	2.35	2.70
5/16	5/16	3/16	3 3/4	4 3/4	2.40	2.70
11/32	11/32	13/64	4	5 1/2	2.45	2.90
3/8	3/8	7/32	4	5 1/2	2.50	2.90
13/32	13/32	15/64	4 3/8	6 1/2	2.55	3.10
7/16	7/16	1/4	4 3/8	6 1/2	2.60	3.10
15/32	15/32	1/4	5 3/8	8 1/8	2.65	3.30
1/2	1/2	1/4	5 3/8	8 1/8	2.75	3.30
9/16	9/16	5/16	5 3/8	8 1/8	2.90	3.50
5/8	5/8	11/32	6 1/8	9 1/8	3.05	3.70
11/16	11/16	3/8	7 1/8	10 1/8	3.20	3.90
3/4	3/4	7/16	7 3/8	10 1/2	3.35	4.10
13/16	13/16	1/2	7 3/8	10 1/2	3.50	4.40
7/8	7/8	9/16	7 3/8	10 5/8	3.75	4.70
15/16	15/16	5/8	7 3/8	10 5/8	4.00	5.00
1	1	11/16	7 3/8	10 5/8	4.25	5.30
1 1/16	1 1/16	3/4	7 3/8	10 5/8	4.50	5.85
1 1/8	1 1/8	13/16	7 3/8	10 5/8	4.75	6.40
1 3/16	1 3/16	7/8	7 3/8	10 5/8	5.00	6.95
1 1/4	1 1/4	15/16	7 3/8	10 5/8	5.50	7.50
1 5/16	1 5/16	1	7 3/8	10 5/8	6.00	8.25
1 3/8	1 3/8	1 1/16	7 3/8	10 5/8	6.50	9.00
1 7/16	1 7/16	1 1/8	7 3/8	10 5/8	7.00	10.00
1 1/2	1 1/2	1 3/16	7 3/8	10 5/8	8.00	11.00

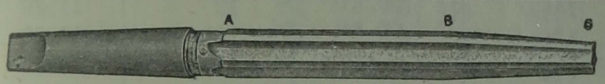

Fig. 39

TAPER SHANK

NO. 150A—CARBON STEEL NO. 615—HIGH SPEED

Diameter, Inches A	Diameter, Inches B	Diameter, Inches C	Length Flute, Inches	Length Over All, Inches	Taper Shank, Nos.	Each Carbon Steel	Each High Speed
1/4	1/4	5/32	3 3/8	6 3/8	1	$2.30	$3.00
9/32	9/32	11/64	3 3/4	6 3/4	1	2.35	3.25
5/16	5/16	3/16	3 3/4	6 3/4	1	2.40	3.25
11/32	11/32	13/64	4	7 1/4	1	2.45	3.50
3/8	3/8	7/32	4	7 1/4	1	2.50	3.50
13/32	13/32	15/64	4 3/8	8 1/4	2	2.55	3.75
7/16	7/16	1/4	4 3/8	8 1/4	2	2.60	3.75
15/32	15/32	1/4	5 1/8	9	2	2.65	4.00
1/2	1/2	1/4	5 1/8	9	2	2.75	4.00
9/16	9/16	5/16	5 1/8	9	2	2.90	4.25
5/8	5/8	11/32	6 1/8	10	2	3.05	4.50
11/16	11/16	3/8	7 1/8	11 3/4	3	3.20	4.75
3/4	3/4	7/16	7 3/8	12	3	3.35	5.00
13/16	13/16	1/2	7 3/8	12	3	3.50	5.30
7/8	7/8	9/16	7 3/8	12	3	3.75	5.70
15/16	15/16	5/8	7 3/8	12	3	4.00	6.00
1	1	11/16	7 3/8	12	3	4.25	6.50
1 1/16	1 1/16	3/4	7 3/8	12	3	4.50	7.00
1 1/8	1 1/8	13/16	7 3/8	12	3	4.75	7.50
1 3/16	1 3/16	7/8	7 3/8	12	3	5.00	8.00
1 1/4	1 1/4	15/16	7 3/8	13	4	5.50	8.75
1 5/16	1 5/16	1	7 3/8	13	4	6.00	9.50
1 3/8	1 3/8	1 1/16	7 3/8	13	4	6.50	10.50
1 7/16	1 7/16	1 1/8	7 3/8	13	4	7.00	12.00
1 1/2	1 1/2	1 3/16	7 3/8	13	4	8.00	14.00

TAPER SOCKET REAMERS

Fig. 40

NO. 144—FINISHING

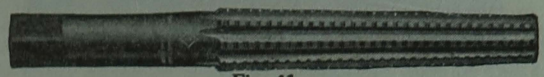

Fig. 41

NO. 144A—ROUGHING

No. of Taper	Length Flute, Inches	Length Over All, Inches	Diameter Large End, Inches	Diameter Small End, Inches	Each Finishing	Each Roughing
0	2 1/4	3 3/4	.369	.252	$1.60	$1.90
1	3	5 1/2	.519	.369	2.00	2.40
2	3 1/2	7	.748	.572	2.60	3.10
3	4 1/4	8	.991	.778	3.40	4.10
4	5 1/4	9	1.293	1.020	4.20	5.05
5	6 1/4	10	1.803	1.475	6.60	7.90
6	8 1/2	12	2.559	2.116	12.00	14.40
7	12	16	3.375	2.750	35.00	42.00

BIT STOCK TAPER REAMERS

Fig. 42

NO. 137A

Taper Approximately 3/4 Inch to the foot. They are about 1/16 Inch larger at the large end than the size stamped on the shank and the point of each reamer will enter the hole reamed by the next size smaller.

Size Inches	Length Flute, Inches	Length Over All, Inches	Each	Size, Inches	Length Flute, Inches	Length Over All, Inches	Each
1/4	1 7/8	4 1/4	$0.60	11/16	3	5 15/16	$1.10
5/16	2	4 1/2	.60	3/4	3 1/8	6 1/4	1.20
3/8	2 1/8	4 3/4	.65	13/16	3 1/8	6 1/4	1.55
7/16	2 1/4	4 15/16	.70	7/8	3 1/2	6 11/16	1.75
1/2	2 1/16	5 5/16	.75	15/16	3 1/2	6 11/16	2.00
9/16	2 11/16	5 9/16	.80	1	4	7 1/4	2.25
5/8	2 3/4	5 11/16	.95				

TAPER PIN REAMERS

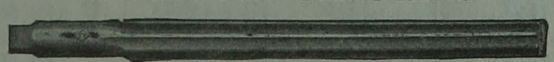

Fig. 43

NO. 137—STANDARD

Taper 1/4 Inch per Foot

Size Nos.	Diameter at Small End, Inches	Length Flute, Inches	Length Over All, Inches	Each
000	.101	1 3/8	2	$1.50
00	.114	1 1/2	2 1/4	1.35
0	.127	1 5/8	2 3/8	1.00
1	.146	1 3/4	2 1/2	1.00
2	.162	2	3	1.25
3	.183	2 1/4	3 1/2	1.50
4	.208	2 1/2	4	1.75
5	.240	3	4 1/2	2.00
6	.279	3 5/8	5	2.25
7	.331	4 1/2	6	2.50
8	.398	5 1/4	6 3/4	3.00
9	.482	6 1/8	8	3.50
10	.581	7	9	4.50
11	.706	8 1/4	11 1/4	6.00
12	.842	10	13 3/8	7.50
13	1.009	12	16	9.00
14	1.250	14	18 1/4	11.00

These Reamers are all of the same taper and the point of each Reamer will enter the hole reamed by the next size smaller.

HIGH SPEED REAMERS

PEERLESS

Composite construction of high-speed blades brazed into a soft steel body produces a solid reamer that can be run at high speeds, and allows of their being marketed at a price considerably below that of solid high-speed steel.

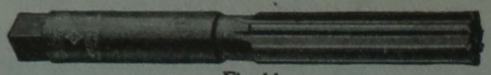

Fig. 44

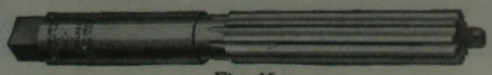

Fig. 45

NO. 501—HAND

Diameter, Inches	Length of Flute, Inches	Length Over All, Inches	Each
1/2	3	6	$2.85
17/32	3 1/8	6 1/4	3.00
9/16	3 1/4	6 1/2	3.10
19/32	3 3/8	6 3/4	3.20
5/8	3 1/2	7	3.30
21/32	3 43/64	7 11/32	3.45
11/16	3 27/32	7 11/16	3.60
23/32	4 1/16	8 1/8	3.75
3/4	4 3/16	8 3/8	3.90
25/32	4 23/64	8 23/32	4.10
13/16	4 17/32	9 1/16	4.30
27/32	4 11/16	9 3/8	4.50
7/8	4 27/32	9 11/16	4.70
29/32	5 3/64	10 3/32	4.90
15/16	5 1/8	10 1/4	5.15
31/32	5 11/32	10 11/16	5.40
1	5 7/16	10 7/8	5.65
1 1/32	5 17/32	11 1/16	6.00
1 1/16	5 5/8	11 1/4	6.40
1 3/32	5 23/32	11 7/16	6.80
1 1/8	5 13/16	11 5/8	7.20
1 5/32	5 29/32	11 13/16	7.60
1 3/16	6	12	8.00
1 7/32	6 1/16	12 1/8	8.40
1 1/4	6 1/8	12 1/4	8.80
1 9/32	6 11/64	12 11/32	9.20
1 5/16	6 7/32	12 7/16	9.60
1 11/32	6 17/64	12 17/32	10.00
1 3/8	6 5/16	12 5/8	10.40
1 13/32	6 23/64	12 23/32	10.80
1 7/16	6 13/32	12 13/16	11.20
1 15/32	6 29/64	12 29/32	11.60
1 1/2	6 1/2	13	12.00
1 17/32	6 1/2	13	12.50
1 9/16	6 1/2	13	13.00
1 19/32	6 1/2	13	13.50
1 5/8	6 1/2	13	14.00
1 21/32	6 3/4	13 1/2	14.50
1 11/16	6 3/4	13 1/2	15.00
1 23/32	6 3/4	13 1/2	15.50
1 3/4	6 3/4	13 1/2	16.00
1 25/32	6 3/4	13 1/2	16.50
1 13/16	6 3/4	13 1/2	17.00
1 27/32	6 3/4	13 1/2	17.50
1 7/8	7	14	18.00
1 29/32	7	14	18.60
1 15/16	7	14	19.20
1 31/32	7	14	20.00
2	7	14	20.80
2 1/16	7 1/4	14 1/2	21.80
2 1/8	7 1/4	14 1/2	22.80
2 3/16	7 1/2	15	24.00
2 1/4	7 1/2	15	25.20
2 5/16	7 1/2	15	26.60
2 3/8	7 1/2	15	27.80
2 7/16	7 3/4	15 1/2	29.00
2 1/2	7 3/4	15 1/2	30.35
2 9/16	7 3/4	15 1/2	31.60
2 5/8	8	16	32.90
2 11/16	8	16	34.20
2 3/4	8	16	35.60
2 13/16	8 1/4	16 1/2	37.00
2 7/8	8 1/4	16 1/2	38.50
2 15/16	8 1/4	16 1/2	40.20
3	8 1/4	16 1/2	42.00

NO. 502—EXPANSION

Diameter, Inches	Length of Flute, Inches	Length Over All, Inches	Each
1/2	3	6	$4.50
17/32	3 1/8	6 1/4	4.75
9/16	3 1/4	6 1/2	5.00
19/32	3 3/8	6 3/4	5.25
5/8	3 1/2	7	5.50
21/32	3 11/16	7 11/32	5.75
11/16	3 7/8	7 11/16	6.00
23/32	4 1/16	8 1/8	6.25
3/4	4 3/16	8 3/8	6.50
25/32	4 3/8	8 23/32	6.75
13/16	4 1/2	9 1/16	7.00
27/32	4 11/16	9 3/8	7.25
7/8	4 7/8	9 11/16	7.50
29/32	5 1/8	10 3/32	7.80
15/16	5 1/8	10 1/4	8.10
31/32	5 5/16	10 11/16	8.50
1	5 1/2	10 7/8	8.90
1 1/32	5 1/2	11 1/16	9.30
1 1/16	5 5/8	11 1/4	9.70
1 3/32	5 3/4	11 7/16	10.20
1 1/8	5 3/4	11 5/8	10.70
1 5/32	5 7/8	11 13/16	11.20
1 3/16	6	12	11.70
1 7/32	6	12 1/8	12.30
1 1/4	6 1/8	12 1/4	12.90
1 9/32	6 1/8	12 11/32	13.50
1 5/16	6 1/4	12 7/16	14.20
1 11/32	6 1/4	12 17/32	14.90
1 3/8	6 3/8	12 5/8	15.65
1 13/32	6 3/8	12 23/32	16.40
1 7/16	6 3/8	12 13/16	17.15
1 15/32	6 1/2	12 29/32	17.90
1 1/2	6 1/2	13	18.60
1 9/16	6 1/2	13	19.60
1 5/8	6 1/2	13	20.70
1 11/16	6 3/4	13 1/2	21.80
1 3/4	6 3/4	13 1/2	23.00
1 13/16	6 3/4	13 1/2	24.25
1 7/8	7	14	25.55
1 15/16	7	14	26.90
2	7	14	28.40
2 1/8	7 1/4	14 1/2	30.10
2 1/4	7 1/2	15	32.00
2 3/8	7 1/2	15	34.10
2 1/2	7 3/4	15 1/2	36.50

Note.—Expansion feature of these reamers is an adoption practically impossible with other high-speed reamers.

The composite construction of soft steel with high speed steel blades makes sufficient expansion to compensate for wear.

The expansion is accomplished by means of the square head screw in the end of the reamer.

ADJUSTABLE SHELL REAMERS

PARADOX

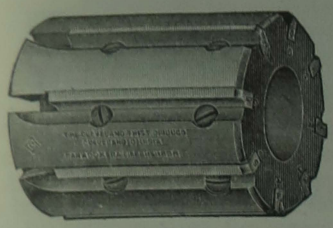

Fig. 46

NO. 301—Eccentric Flutes

These Reamers have a body of tough machinery steel, case-hardened where subject to wear, into which are inserted blades of finely tempered tool steel.

To make adjustments, loosen the screws, remove one or more blades and insert tinfoil, or some other similar substance, in the grooves, screwing down the blades on top of it. Adjustments ranging from .0005 to $\frac{3}{32}$nd Inch may be had in the case of 3-Inch Reamers, the range being less, of course, for the smaller sizes and somewhat greater for the larger Reamers.

Additional blades from stock can be furnished on short notice. When ordering them give the numbers of the body grooves in which they are to go, with the size and list number of the tool.

Dia., Ins.	Size Hole, Ins.	Length Blade, Ins.	Length Over All, Ins.	Each	Dia., Ins.	Size Hole, Ins.	Length Blade, Ins.	Length Over All, Ins.	Each	Dia., Ins.	Size Hole, Ins.	Length Blade, Ins.	Length Over All, Ins.	Each
1 3/8	1/2	2	2 1/2	$6.35	2 15/16	1 1/4	3	3 3/4	$14.00	4 1/2	2 1/4	4 1/2	5 1/2	$26.50
1 7/16	1/2	2	2 1/2	6.90	3	1 1/4	3	3 3/4	14.50	4 9/16	2 1/2	5	6	27.00
1 1/2	1/2	2	2 1/2	7.40	3 1/16	1 1/4	3	3 3/4	15.00	4 5/8	2 1/2	5	6	27.50
1 9/16	1/2	2	2 1/2	7.60	3 1/8	1 1/4	3	3 3/4	15.50	4 11/16	2 1/2	5	6	28.00
1 5/8	5/8	2 1/4	2 3/4	7.80	3 3/16	1 1/2	3 1/4	4	16.00	4 3/4	2 1/2	5	6	28.50
1 11/16	5/8	2 1/4	2 3/4	8.00	3 1/4	1 1/2	3 1/4	4	16.50	4 13/16	2 1/2	5	6	29.00
1 3/4	5/8	2 1/4	2 3/4	8.15	3 5/16	1 1/2	3 1/4	4	17.00	4 7/8	2 1/2	5	6	29.50
1 13/16	3/4	2 1/2	3	8.35	3 3/8	1 1/2	3 1/4	4	17.50	4 15/16	2 1/2	5	6	30.00
1 7/8	3/4	2 1/2	3	8.50	3 7/16	1 1/2	3 1/4	4	18.00	5	2 1/2	5	6	30.50
1 15/16	3/4	2 1/2	3	8.70	3 1/2	1 1/2	3 1/4	4	18.50	5 1/16	2 1/2	5	6	30.80
2	3/4	2 1/2	3	8.85	3 9/16	1 3/4	3 1/2	4 1/2	19.00	5 1/8	2 1/2	5	6	31.20
2 1/16	3/4	2 1/2	3	9.00	3 5/8	1 3/4	3 1/2	4 1/2	19.50	5 3/16	2 1/2	5	6	31.60
2 1/8	3/4	2 1/2	3	9.25	3 11/16	1 3/4	3 1/2	4 1/2	20.00	5 1/4	2 1/2	5	6	32.00
2 3/16	3/4	2 1/2	3	9.50	3 3/4	1 3/4	3 1/2	4 1/2	20.50	5 5/16	2 1/2	5	6	32.50
2 1/4	3/4	2 1/2	3	9.70	3 13/16	1 3/4	3 1/2	4 1/2	21.00	5 3/8	2 1/2	5	6	33.00
2 5/16	1	2 3/4	3 1/2	10.00	3 7/8	1 3/4	3 1/2	4 1/2	21.50	5 7/16	2 1/2	5	6	33.50
2 3/8	1	2 3/4	3 1/2	10.25	3 15/16	2	4	5	22.00	5 1/2	2 1/2	5	6	34.00
2 7/16	1	2 3/4	3 1/2	10.50	4	2	4	5	22.50	5 9/16	2 3/4	5 1/2	6 1/2	34.50
2 1/2	1	2 3/4	3 1/2	10.75	4 1/16	2	4	5	23.00	5 5/8	2 3/4	5 1/2	6 1/2	35.00
2 9/16	1	2 3/4	3 1/2	11.00	4 1/8	2	4	5	23.50	5 11/16	2 3/4	5 1/2	6 1/2	35.50
2 5/8	1	2 3/4	3 1/2	11.50	4 3/16	2	4	5	24.00	5 3/4	2 3/4	5 1/2	6 1/2	36.00
2 11/16	1 1/4	3	3 3/4	12.00	4 1/4	2	4	5	24.50	5 13/16	2 3/4	5 1/2	6 1/2	36.50
2 3/4	1 1/4	3	3 3/4	12.50	4 5/16	2 1/4	4 1/2	5 1/2	25.00	5 7/8	2 3/4	5 1/2	6 1/2	37.00
2 13/16	1 1/4	3	3 3/4	13.00	4 3/8	2 1/4	4 1/2	5 1/2	25.50	5 15/16	2 3/4	5 1/2	6 1/2	37.50
2 7/8	1 1/4	3	3 3/4	13.50	4 7/16	2 1/4	4 1/2	5 1/2	26.00	6	2 3/4	5 1/2	6 1/2	38.00

Shell Reamers have taper holes, the diameter given being that of the large end.

Above Reamers Fit Arbors as Follows:—

Diameter, Inches	1 3/8 to 1 9/16	1 5/8 to 1 3/4	1 13/16 to 2 1/4	2 5/16 to 2 5/8	2 11/16 to 3 1/8	3 3/16 to 3 1/2
Fit Arbors, Nos	5–7	6–7 1/2	7–8	8–9	9–10	10
Diameter, Inches	3 9/16 to 3 7/8	3 15/16 to 4 1/4	4 5/16 to 4 1/2	4 9/16 to 5 1/2	5 9/16 to 6	
Fit Arbors, Nos	11	12	13	14	15	

ARBORS FOR ADJUSTABLE SHELL REAMERS

PARADOX

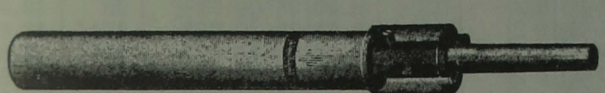

Fig. 47

NO. 335—STRAIGHT SHANK
NO. 336—TAPER SHANK

For Reamers Up to 3 1/8 Inches in Diameter

Extra heavy Collars and Bodies. The Collar is movably attached to the body, into which the driving keys, integral with the collar are longitudinally mortised. The collar, after loosening the set-screw which secures it to the body, may be driven along the body in such a way as to release any tight-fitting shell tool without damaging it.

Size Nos.	Fitting Sizes of Reamers, Inches	Length Over All, Inches	Taper Shank		Straight Shank, Each
			Shank Nos.	Each	
5-7	1 3/8 to 1 9/16	10	3	$5.40	$4.50
6-7 1/2	1 37/64 to 1 3/4	11	4	5.95	4.95
7-8	1 49/64 to 2 1/4	12	4	6.50	5.40
8-9	2 17/64 to 2 5/8	13	5	7.20	6.00
9-10	2 41/64 to 3 1/8	14	5	8.10	6.75

Fig. 48

NO. 133—STRAIGHT SHANK
NO. 133A—TAPER SHANK

For Reamers Over 3 1/8 Inches in Diameter

These Arbors are regular in all respects.

Size Nos.	Fitting Sizes, Inches	Length Over All, Inches	Taper Shank		Straight Shank, Each
			Shank Nos.	Each	
10	3 49/64 to 3 1/2	14	5	$6.30	$5.25
11	3 33/64 to 3 7/8	15	5	9.00	7.50
12	3 57/64 to 4 1/4	16	5	12.60	10.50
13	4 17/64 to 4 1/2	17	5	16.20	13.50
14	4 33/64 to 5 1/2	18	5	21.60	18.00
15	5 33/64 to 6	19	5	26.40	22.00

ADJUSTABLE HAND REAMERS
PARADOX

Fig. 49

NO. 306

These Reamers have a body of tough machinery steel, case-hardened where subject to wear, into which are inserted blades of finely tempered tool steel.

To make adjustments, loosen the screws, remove one or two blades and insert tinfoil, or some similar substance, in the grooves, screwing down the blades on top of it. Adjustments ranging from .0005 to 3/32 inch may be had in the case of 3-inch Reamers, the range being less, of course, for the smaller sizes and somewhat greater for the larger Reamers.

Additional blades can be furnished. When ordering them give the numbers of the body grooves in which they are to go, with the size and list number of the tool—if an entire new set is wanted the size and list number of the tool will be sufficient.

Dia., Ins.	Length Blade, Inches	Length Over All, Ins.	Each	Dia., Ins.	Length Blade, Inches	Length Over All, Ins.	Each
1	3	7 5/8	$6.40	21/32	4 1/2	11 3/8	$12.90
1 1/32	3	7 3/4	6.55	21/16	4 1/2	11 1/2	13.25
1 1/16	3 1/8	7 7/8	6.70	23/32	4 1/2	11 1/2	13.50
1 3/32	3 1/8	8	6.85	21/8	4 1/2	11 5/8	13.75
1 1/8	3 1/8	8 1/8	7.00	25/32	4 1/2	11 3/4	14.00
1 5/32	3 1/8	8 1/4	7.20	23/16	4 3/4	11 7/8	14.25
1 3/16	3 1/4	8 1/4	7.40	27/32	4 3/4	12	14.55
1 7/32	3 1/4	8 3/8	7.60	21/4	4 3/4	12 1/8	14.80
1 1/4	3 1/4	8 1/2	7.80	29/32	4 3/4	12 1/4	15.05
1 9/32	3 1/4	8 5/8	8.00	25/16	4 3/4	12 3/8	15.30
1 5/16	3 1/2	8 3/4	8.20	211/32	4 3/4	12 1/2	15.60
1 11/32	3 1/2	8 7/8	8.40	23/8	5	12 5/8	15.85
1 3/8	3 1/2	9	8.60	213/32	5	12 5/8	16.15
1 13/32	3 1/2	9 1/8	8.80	27/16	5	12 3/4	16.40
1 7/16	3 1/2	9 1/4	9.00	215/32	5	12 7/8	16.65
1 15/32	3 1/2	9 3/8	9.20	21/2	5	13	16.90
1 1/2	3 3/4	9 1/2	9.40	217/32	5	13 1/8	17.20
1 17/32	3 3/4	9 1/2	9.60	29/16	5 1/4	13 1/4	17.45
1 9/16	3 3/4	9 5/8	9.80	219/32	5 1/4	13 3/8	17.70
1 19/32	3 3/4	9 3/4	10.00	25/8	5 1/4	13 1/2	17.95
1 5/8	4	9 7/8	10.20	221/32	5 1/4	13 5/8	18.25
1 21/32	4	10	10.40	211/16	5 1/4	13 3/4	18.50
1 11/16	4	10 1/8	10.60	223/32	5 1/4	13 3/4	18.75
1 23/32	4	10 1/4	10.80	23/4	5 1/4	13 7/8	19.00
1 3/4	4	10 1/4	11.00	225/32	5 1/4	14	19.30
1 25/32	4	10 3/8	11.20	213/16	5 1/4	14 1/8	19.55
1 13/16	4 1/4	10 1/2	11.40	227/32	5 1/4	14 1/4	19.85
1 27/32	4 1/4	10 5/8	11.60	27/8	5 1/4	14 3/8	20.10
1 7/8	4 1/4	10 3/4	11.80	229/32	5 1/4	14 1/2	20.35
1 29/32	4 1/4	10 7/8	12.00	215/16	5 1/4	14 5/8	20.60
1 15/16	4 1/4	11	12.20	231/32	5 1/4	14 3/4	20.90
1 31/32	4 1/4	11 1/8	12.45	3	5 1/4	14 7/8	21.15
2	4 1/2	11 1/4	12.65				

These Reamers can be furnished down to 11/16-inch diameter, but on account of their construction the sizes smaller than 1 inch are not strong enough for any but the lightest sort of work and we do not recommend their use.

For expanding these Reamers, tinfoil of .001 and .0005-inch thickness will be furnished upon application.

ADJUSTABLE CHUCKING REAMERS
PARADOX—ECCENTRIC FLUTES

Fig. 50

NO. 312—STRAIGHT SHANK

Fig. 51

NO. 317—TAPER SHANK

These Reamers have a body of tough machinery steel, case-hardened where subject to wear, into which are inserted blades of finely tempered tool steel.

Additional blades can be furnished on short notice. When ordering them give the numbers of the body grooves in which they are to go, with the size and list number of the tool. If an entire new set is wanted the size and list number of the tool will be sufficient.

STRAIGHT OR TAPER SHANK

Dia., Ins.	Length Blade, Inches	Length Over All, Inches	Each	Dia., Ins.	Length Blade, Inches	Length Over All, Inches	Each
1	1 3/4	10 1/2	$5.00	21/32	2 1/2	14	$10.45
1 1/32	1 3/4	10 1/2	5.15	21/16	2 1/2	14 1/2	10.65
1 1/16	1 3/4	10 1/2	5.25	23/32	2 1/2	14 1/2	10.85
1 3/32	1 3/4	10 1/2	5.40	21/8	2 1/2	14 1/2	11.05
1 1/8	2	11	5.50	25/32	2 1/2	14 1/2	11.25
1 5/32	2	11	5.60	23/16	2 1/2	14 1/2	11.45
1 3/16	2	11	5.75	27/32	2 1/2	14 1/2	11.70
1 7/32	2	11	5.90	21/4	2 1/2	14 1/2	11.90
1 1/4	2	11 1/2	6.00	29/32	2 1/2	14 1/2	12.05
1 9/32	2	11 1/2	6.25	25/16	2 3/4	15	12.20
1 5/16	2	11 1/2	6.50	211/32	2 3/4	15	12.35
1 11/32	2	11 1/2	6.75	23/8	2 3/4	15	12.50
1 3/8	2	12	7.00	213/32	2 3/4	15	12.65
1 13/32	2	12	7.25	27/16	2 3/4	15	12.80
1 7/16	2	12	7.50	215/32	2 3/4	15	12.95
1 15/32	2	12	7.75	21/2	2 3/4	15	13.10
1 1/2	2	12 1/2	8.00	217/32	2 3/4	15	13.35
1 17/32	2	12 1/2	8.15	29/16	2 3/4	15 1/2	13.60
1 9/16	2	12 1/2	8.25	219/32	2 3/4	15 1/2	13.90
1 19/32	2	12 1/2	8.40	25/8	2 3/4	15 1/2	14.20
1 5/8	2 1/4	13	8.50	221/32	2 3/4	15 1/2	14.55
1 21/32	2 1/4	13	8.65	211/16	3	15 1/2	14.90
1 11/16	2 1/4	13	8.75	223/32	3	15 1/2	15.30
1 23/32	2 1/4	13	8.90	23/4	3	15 1/2	15.65
1 3/4	2 1/4	13 1/2	9.00	225/32	3	15 1/2	16.05
1 25/32	2 1/4	13 1/2	9.15	213/16	3	16	16.45
1 13/16	2 1/2	13 1/2	9.30	227/32	3	16	16.90
1 27/32	2 1/2	13 1/2	9.45	27/8	3	16	17.30
1 7/8	2 1/2	14	9.60	229/32	3	16	17.75
1 29/32	2 1/2	14	9.75	215/16	3	16	18.20
1 15/16	2 1/2	14	9.90	231/32	3	16	18.65
1 31/32	2 1/2	14	10.05	3	3	16	19.10
2	2 1/2	14	10.25				

These Reamers can be furnished down to 11/16-inch diameter, but on account of their construction the sizes smaller than 1 inch are not strong enough for any but the very lightest sort of work and we do not recommend their use.

For expanding these Reamers, tinfoil of .001 and .0005-inch thickness will be furnished upon application.

EXPANSION REAMERS

COMMON SENSE-ECCENTRIC FLUTES

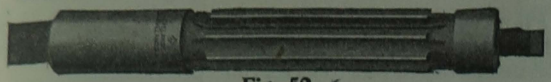

Fig. 52

No. 129

The expansion and contraction of these reamers is accomplished by turning the square head screw in the end.

Are not intended to ream smaller than size stamped on body, expansive feature is designed to maintain initial size by compensating for wear.

Fractional Sizes

Limits of expansion recommended for these reamers are as follows: Sizes 1/4 to 15/32, .005 inch; 1/2 to 31/32, .008 inch; 1 inch to 1 23/32, .010 inch; 1 3/4 to 2 1/2, .012 inch. The pilots on these reamers are ground slightly undersize.

Dia., Ins.	Length Flute, Inches	Length Over All, Inches	Each	Dia., Ins.	Length Flute, Inches	Length Over All, Inches	Each
1/4	2	3 3/4	$3.00	31/32	4 3/4	8 9/32	$6.50
9/32	2 1/8	3 7/8	3.05	1	4 7/8	8 1/2	6.75
5/16	2 19/64	4	3.10	1 1/16	5 1/8	9	7.25
11/32	2 5/16	4 1/8	3.15	1 1/8	5 1/4	9 1/4	7.75
3/8	2 1/2	4 1/4	3.20	1 3/16	5 3/8	9 9/16	8.30
13/32	2 7/16	4 3/8	3.25	1 1/4	5 1/2	9 7/8	8.90
7/16	2 33/64	4 1/2	3.30	1 5/16	5 3/4	10 1/8	9.50
15/32	2 33/64	4 3/4	3.35	1 3/8	5 7/8	10 3/8	10.50
1/2	2 33/64	5	3.40	1 7/16	5 15/16	10 5/8	11.50
17/32	2 5/8	5 3/16	3.50	1 1/2	6	10 3/4	12.50
9/16	2 3/4	5 3/8	3.65	1 9/16	6 1/8	11 1/8	13.00
19/32	2 7/8	5 9/16	3.80	1 5/8	6 1/4	11 1/4	13.50
5/8	3 1/8	5 3/4	4.00	1 11/16	6 3/8	11 3/8	14.00
21/32	3 5/16	6	4.20	1 3/4	6 1/2	11 1/2	14.50
11/16	3 1/2	6 1/4	4.40	1 13/16	6 5/8	11 3/4	15.00
23/32	3 9/16	6 7/16	4.60	1 7/8	6 3/4	11 3/4	15.50
3/4	3 5/8	6 5/8	4.80	1 15/16	6 7/8	12	16.00
25/32	3 13/16	6 7/8	5.00	2	7	12 1/4	16.50
13/16	4	7 1/8	5.25	2 1/8	7 1/8	12 5/8	17.50
27/32	4 3/16	7 3/8	5.50	2 1/4	7 1/4	13	18.50
7/8	4 5/16	7 9/16	5.75	2 3/8	7 3/8	13 1/2	19.50
29/32	4 7/16	7 13/16	6.00	2 1/2	7 1/2	14	20.50
15/16	4 9/16	8 1/16	6.25				

MILLIMETER SIZES

Limits of expansion recommended for these reamers are as follows: Sizes 6 to 12 m/m, .005 inch; 13 to 25 m/m, .008 inch; 26 to 44 m/m, .010 inch; 45 to 50 m/m, .012 inch.

Dia., m/m	Length Over All, m/m	Each	Dia., m/m	Length Over All, m/m	Each
6	95	$3.00	29	235	$8.00
7	98	3.05	30	243	8.30
8	102	3.15	31	247	8.90
9	105	3.20	32	251	9.20
10	111	3.25	33	254	9.50
11	114	3.30	34	257	10.00
12	121	3.40	35	263	11.00
13	127	3.50	36	267	11.50
14	136	3.65	37	270	12.00
15	141	3.80	38	273	12.50
16	146	4.20	39	283	13.00
17	152	4.40	40	283	13.25
18	159	4.60	41	286	13.50
19	168	4.80	42	286	13.75
20	175	5.25	43	292	14.25
21	181	5.50	44	292	14.50
22	192	5.75	45	298	14.74
23	198	6.00	46	298	15.00
24	205	6.50	47	298	15.50
25	210	6.75	48	298	15.75
26	216	7.00	49	305	16.00
27	229	7.25	50	305	16.25
28	232	7.75			

Note.—Reamers for brass or bronze require special clearance and are so furnished on request.

EXPANDING REAMERS

CRITCHLEY

Fig. 53

Body has taper grooves fitted with cutters; a screw thread is cut on the body of the tool and a portion of it is left to prevent springing; cutters are beveled at each end and confined in their places by nuts, so that it is only necessary to slacken them off and slide the cutters up or down in the tapered grooves to expand or contract their outside diameters and thus adapt them to any size within their limit.

The expanding feature, particularly on the small sizes, maintains the initial size of the reamer by compensating for wear. Expansion is 1/16 inch on the 1/2-inch size, increasing with each size of reamer. One of these reamers has the range of four reamers of other makes. Body turned from fine machine steel; cutting blades are of tool steel, carefully finished and tempered.

NOS.	Diameter, Inches	Expands to Diameter, Inches	Length Cutter, Inches	Length Over All, Inches	Each
00	15/32	17/32	1 3/4	5 1/2	$4.50
00 1/4	17/32	9/16	1 3/4	5 5/8	4.50
00 1/2	9/16	5/8	1 3/4	5 3/4	4.50
0	5/8	11/16	2 1/2	6 1/2	4.75
0 1/2	11/16	3/4	2 1/2	6 3/4	4.75
1	3/4	13/16	2 5/8	7	5.00
1 1/2	13/16	7/8	2 5/8	7 1/4	5.00
2	7/8	31/32	2 3/4	8	5.50
3	31/32	1 1/8	3	9	5.80
4	1 1/8	1 9/32	3 1/4	10	6.60
5	1 9/32	1 15/32	3 3/4	11	7.50
6	1 15/32	1 11/16	4	12	8.50
7	1 11/16	1 15/16	4 1/4	14	9.90
8	1 15/16	2 1/4	4 3/4	16	11.50
9	2 1/4	2 5/8	5 1/4	18	14.00
10	2 5/8	3 1/16	6 1/4	20	17.00
11	3 1/16	3 9/16	7	22	20.00
12	3 9/16	4 1/8	7 3/4	24	24.00

EXTRA CUTTERS

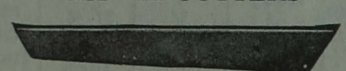

Fig. 54

No. of Reamer	No. of Blades	Each	No. of Reamer	No. of Blades	Each
00-1	5	$0.30	8	5	$0.70
2-3	5	.36	9	6	.80
4	5	.40	10	6	.90
5	5	.44	11	6	1.00
6	5	.50	12	6	1.20
7	5	.60			

EXTRA ADJUSTING NUTS

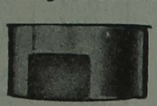

Fig. 55

No. of Reamer	Each	No. of Reamer	Each
00-3	$0.30	8	$0.60
4	.35	9	.70
5	.40	10	.90
6	.45	11	1.00
7	.56	12	1.20

COUNTERBORES

WITH INTERCHANGEABLE PILOTS

These Counterbores are accurately ground on centers. The Pilots have taper shanks ground to fit the taper pilot-hole in the end of the Counterbore. As the Pilots in each group are interchangeable, fitting any size Counterbore in the group, a wide variety of combinations is possible. To eject Pilots insert taper pin in drift hole provided.

Fig. 56

STRAIGHT SHANK

NO. 176—CARBON STEEL
NO. 876—HIGH SPEED STEEL

COUNTERBORES

Diameter, Inches	Group Letter	Length Over All, Inches	Size Shank, Inches	Each	
				Carbon Steel	High Speed
5/16	A	5 3/4	3/8 x 2 1/4	$1.70	$2.20
11/32	A	5 3/4	3/8 x 2 1/4	1.75	2.35
3/8	A	5 3/4	3/8 x 2 1/4	1.80	2.50
7/16	B	6 1/8	7/16 x 2 1/4	1.90	2.80
1/2	B	6 3/8	1/2 x 2 1/2	2.00	3.10
9/16	B	6 1/2	1/2 x 2 1/2	2.15	3.50
5/8	B	7	5/8 x 2 5/8	2.30	4.00
11/16	C	7	5/8 x 2 5/8	2.45	4.60
3/4	C	7 1/4	3/4 x 2 3/4	2.60	5.25
13/16	C	7 1/2	3/4 x 2 3/4	2.80	6.00
7/8	D	7 3/4	7/8 x 3	3.00	6.75
15/16	D	8 1/2	7/8 x 3	3.25	7.50
1	D	9	1 x 3	3.50	8.25
1 1/16	E	9	1 x 3	3.75	9.00
1 1/8	E	9 1/4	1 1/8 x 3 1/4	4.00	9.75
1 3/16	E	9 1/4	1 1/8 x 2 1/4	4.50	10.50
1 1/4	E	9 1/2	1 1/4 x 3 1/2	5.00	11.25
1 5/16	E	9 1/2	1 1/4 x 3 1/2	5.50	12.00
1 3/8	E	9 1/2	1 1/4 x 3 1/2	6.00	13.00

PILOTS

Diameter, Inches	Group Letter	For Body of Screw, Inch	Tap Drill Sizes		*Minimum Size, Inches	Each
			V Third, Inch	U. S. St'd, Inch		
5/16	A	.249	.160	.169	.158	.500 in. and smaller $0.50
11/32	A	.249	.181	.186	.158	.500 in. and smaller $0.50
3/8	A	.249	.181	.186	.158	.500 in. and smaller $0.50
7/16	B	.311	.233	.241	.230	.500 in. and smaller $0.50
1/2	B	.374	.289	.301	.230	.500 in. and smaller $0.50
9/16	B	.436	.338	.347	.230	.500 in. and smaller $0.50
5/8	B	.436	.338	.347	.230	.500 in. and smaller $0.50
11/16	C	.499	.396	.405	.312	.750 in. down to .500 in. $0.75
3/4	C	.561	.452	.452	.312	.750 in. down to .500 in. $0.75
13/16	C	.561	.452	.452	.312	.750 in. down to .500 in. $0.75
7/8	D	.624	.499	.514	.382	.750 in. down to .500 in. $0.75
15/16	D	.686	.529	.568	.382	.750 in. down to .500 in. $0.75
1	D	.749	.608	.624	.382	.750 in. down to .500 in. $0.75
1 1/16	E	.749	.608	.624	.455	1 inch down to .750 in. $1.00
1 1/8	E	.811	.670	.681	.455	1 inch down to .750 in. $1.00
1 3/16	E	.874	.717	.733	.455	1 inch down to .750 in. $1.00
1 1/4	E	.936	.780	.793	.455	1 inch down to .750 in. $1.00
1 5/16	E	.999	.827	.842	.455	1 inch down to .750 in. $1.00
1 3/8	E	.999	.827	.842	.455	1 inch down to .750 in. $1.00

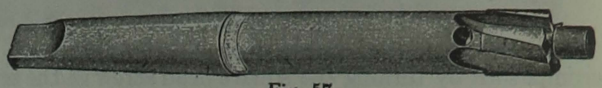

Fig. 57

TAPER SHANK

NO. 177—CARBON STEEL
NO. 877—HIGH SPEED STEEL

COUNTERBORES

Diameter, Inches	Group Letter	Length Over All, Inches	Taper Shank, Nos.	Each	
				Carbon Steel	High Speed
5/16	A	5 3/4	1	$1.85	$2.50
11/32	A	5 3/4	1	1.95	2.65
3/8	A	5 3/4	1	2.00	2.80
7/16	B	6 1/8	1	2.10	3.10
1/2	B	6 3/8	1	2.20	3.40
9/16	B	6 1/2	1	2.35	3.80
5/8	B	7	2	2.55	4.30
11/16	C	7	2	2.70	5.00
3/4	C	7 1/4	2	2.85	5.65
13/16	C	7 1/2	2	3.10	6.40
7/8	D	7 3/4	2	3.30	7.20
15/16	D	8 1/2	3	3.55	8.00
1	D	9	3	3.85	8.75
1 1/16	E	9	3	4.15	9.50
1 1/8	E	9 1/4	3	4.40	10.25
1 3/16	E	9 1/4	3	4.95	11.10
1 1/4	E	9 1/2	3	5.50	11.90
1 5/16	E	9 1/2	3	6.05	12.70
1 3/8	E	9 1/2	3	6.60	13.80

PILOTS

Diameter, Inches	Group Letter	For Body of Screw, Inch	Tap Drill Sizes		*Minimum Size, Inches	Each
			V Third, Inch	U. S. St'd, Inch		
5/16	A	.249	.160	.169	.158	.500 in. and smaller $0.50
11/32	A	.249	.181	.186	.158	.500 in. and smaller $0.50
3/8	A	.249	.181	.186	.158	.500 in. and smaller $0.50
7/16	B	.311	.233	.241	.230	.500 in. and smaller $0.50
1/2	B	.374	.239	.301	.230	.500 in. and smaller $0.50
9/16	B	.436	.338	.347	.230	.500 in. and smaller $0.50
5/8	B	.436	.338	.347	.230	.500 in. and smaller $0.50
11/16	C	.499	.396	.452	.312	.750 in. down to .500 in. $0.75
3/4	C	.561	.452	.405	.312	.750 in. down to .500 in. $0.75
13/16	C	.561	.452	.405	.312	.750 in. down to .500 in. $0.75
7/8	D	.624	.499	.514	.382	.750 in. down to .500 in. $0.75
15/16	D	.686	.529	.568	.382	.750 in. down to .500 in. $0.75
1	D	.749	.608	.624	.382	.750 in. down to .500 in. $0.75
1 1/16	E	.749	.608	.624	.455	1 inch down to .750 in. $1.00
1 1/8	E	.811	.670	.681	.455	1 inch down to .750 in. $1.00
1 3/16	E	.874	.717	.733	.455	1 inch down to .750 in. $1.00
1 1/4	E	.936	.780	.793	.455	1 inch down to .750 in. $1.00
1 5/16	E	.999	.827	.842	.455	1 inch down to .750 in. $1.00
1 3/8	E	.999	.827	.842	.455	1 inch down to .750 in. $1.00

*Pilot sizes listed in "Minimum Size" Column are **not stock sizes**, but simply show the **smallest pilots that can be used in** the Counterbores in each group. They will be furnished at **special prices** only.

When ordering Counterbores always specify sizes of Pilots wanted.

When ordering Pilots always give **size** and **group letter.**

SOLID COUNTERBORES

Counterbores given in the table below are furnished either singly or in sets. A set consists of one counterbore for head of screw with guide of body size, one counterbore for head with guide of tap drill size, and one counterbore to enlarge a tap drill hole to body size. Counterbores of other sizes are made to order at special prices.

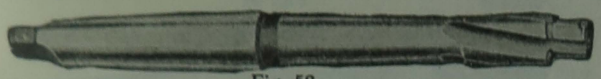

Fig. 58

NO. 765—TAPER SHANK

Dia. Counterbore, Ins.	Diameter of Guide, Inches: For Body Size Hole	Diameter of Guide, Inches: For Tap Drill Hole	Dia. of Screw and Pitch, U.S. Std.	Length Over All, Ins.	Taper Shank No.	Each
1/4	..	.1865	1/4–20	5 3/4	1	$1.75
5/16	..	.241	5/16–18	6 1/8	1	1.85
3/8	..	.1865	1/4–20	5 3/4	1	2.00
3/8	1/4	..	1/4–20	5 3/4	1	2.00
3/8	..	.301	3/8–16	6 1/2	1	2.00
7/16	..	.241	5/16–18	6 1/8	1	2.10
7/16	5/16	..	5/16–18	6 1/8	1	2.10
7/16	..	.347	7/16–14	7	2	2.10
1/2	..	.4057	1/2–13	7 1/4	2	2.20
9/16	..	.301	3/8–16	6 1/2	1	2.35
9/16	3/8	..	3/8–16	6 1/2	1	2.35
9/16	..	.452	9/16–12	7 1/2	2	2.35
5/8	..	.347	7/16–14	7	2	2.55
5/8	7/16	..	7/16–14	7	2	2.55
5/8	..	.5146	5/8–11	7 3/4	2	2.55
11/16	..	.5771	11/16–11	8 1/2	3	2.70
3/4	..	.4057	1/2–13	7 1/4	2	2.85
3/4	1/2	..	1/2–13	7 1/4	2	2.85
3/4	..	.624	3/4–10	9	3	2.85
13/16	..	.452	9/16–12	7 1/2	2	3.10
13/16	9/16	..	9/16–12	7 1/2	2	3.10
13/16	..	.6865	13/16–10	9	3	3.10
7/8	..	.5146	5/8–11	7 3/4	2	3.30
7/8	5/8	..	5/8–11	7 3/4	2	3.30
7/8	..	.7333	7/8–9	9 1/4	3	3.30
15/16	..	.5771	11/16–11	8 1/2	3	3.55
15/16	11/16	..	11/16–11	8 1/2	3	3.55
15/16	..	.7958	15/16–9	9 1/4	3	3.55
1	..	.624	3/4–10	9	3	3.85
1	3/4	..	3/4–10	9	3	3.85
1	..	.8427	1 –8	9 1/2	3	3.85
1 1/16	..	.6865	13/16–10	9	3	4.15
1 1/16	13/16	..	13/16–10	9	3	4.15
1 1/8	..	.7333	7/8–9	9 1/4	3	4.40
1 1/8	7/8	..	7/8–9	9 1/4	3	4.40
1 3/16	..	.7958	15/16–9	9 1/4	3	4.95
1 3/16	15/16	..	15/16–9	9 1/4	3	4.95
1 1/4	..	.8427	1 –8	9 1/2	3	5.50
1 1/4	1	..	1 –8	9 1/2	3	5.50

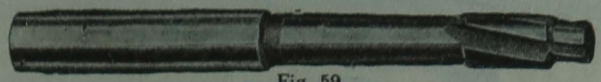

Fig. 59

NO. 766—STRAIGHT SHANK

Dia. Counterbore, Inches	Diameter of Guide, Inches: For Body Size Hole	Diameter of Guide, Inches: For Tap Drill Hole	Diameter of Screw and Pitch, U. S. Std.	Length Over All, Inches	Shank: Length, Ins.	Shank: Dia., Ins.	Each
1/4	..	.1865	1/4–20	5 3/4	2 9/16	1/2	$1.60
5/16	..	.241	5/16–18	6 1/8	2 9/16	1/2	1.70
3/8	..	1865	1/4–20	5 3/4	2 9/16	1/2	1.80
3/8	1/4	..	1/4–20	5 3/4	2 9/16	1/2	1.80
3/8	..	.301	3/8–16	6 1/2	2 9/16	1/2	1.80
7/16	..	.241	5/16–18	6 1/8	2 9/16	1/2	1.90
7/16	5/16	..	5/16–18	6 1/8	2 9/16	1/2	1.90
7/16	..	.347	7/16–14	7	3 1/8	11/16	1.90
1/2	..	.4057	1/2–13	7 1/4	3 1/8	11/16	2.00
9/16	..	.301	3/8–16	6 1/2	2 9/16	1/2	2.15
9/16	3/8	..	3/8–16	6 1/2	2 9/16	1/2	2.15
9/16	..	.452	9/16–12	7 1/2	3 1/8	11/16	2.15
5/8	..	.347	7/16–14	7	3 1/8	11/16	2.30
5/8	7/16	..	7/16–14	7	3 1/8	11/16	2.30
5/8	..	.5146	5/8–11	7 3/4	3 1/8	11/16	2.30
11/16	..	.5771	11/16–11	8 1/2	3 7/8	15/16	2.45
3/4	..	.4057	1/2–13	7 1/4	3 1/8	11/16	2.60
3/4	1/2	..	1/2–13	7 1/4	3 1/8	11/16	2.60
3/4	..	.624	3/4–10	9	3 7/8	15/16	2.60
13/16	..	.452	9/16–12	7 1/2	3 1/8	11/16	2.80
13/16	9/16	..	9/16–12	7 1/2	3 1/8	11/16	2.80
13/16	..	.6865	13/16–10	9	3 7/8	1	2.80
7/8	..	.5146	5/8–11	7 3/4	3 1/8	11/16	3.00
7/8	5/8	..	5/8–11	7 3/4	3 1/8	11/16	3.00
7/8	..	.7333	7/8–9	9 1/4	3 7/8	1	3.00
15/16	..	.5771	11/16–11	8 1/2	3 7/8	15/16	3.25
15/16	11/16	..	11/16–11	8 1/2	3 7/8	15/16	3.25
15/16	..	.7958	15/16–9	9 1/4	3 7/8	1	3.25
1	..	.624	3/4–10	9	3 7/8	15/16	3.50
1	3/4	..	3/4–10	9	3 7/8	15/16	3.50
1	..	.8427	1 –8	9 1/2	3 7/8	1	3.50
1 1/16	..	.6865	13/16–10	9	3 7/8	1	3.75
1 1/16	13/16	..	13/16–10	9	3 7/8	1	3.75
1 1/8	..	.7333	7/8–9	9 1/4	3 7/8	1	4.00
1 1/8	7/8	..	7/8–9	9 1/4	3 7/8	1	4.00
1 3/16	..	.7958	15/16–9	9 1/4	3 7/8	1	4.50
1 3/16	15/16	..	15/16–9	9 1/4	3 7/8	1	4.50
1 1/4	..	.8427	1 –8	9 1/2	3 7/8	1	5.00
1 1/4	1	..	1 –8	9 1/2	3 7/8	1	5.00

COUNTERBORES AND COUNTERSINKS

QUICK CUTTING
FOR STANDARD MACHINE SCREWS

Fig. 60

COUNTERBORE—FOR FILLISTER HEAD

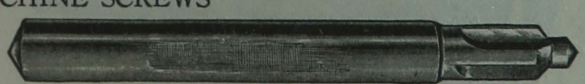

Fig. 61

COUNTERSINK—FOR FLAT HEAD

These tools may be sharpened by grinding, and, having multiple cutting edges, are very durable. The prices are but a small fraction of what it would cost any workman to make them.

Made by machinery designed especially for the purpose, insuring perfectly reliable quick cutters—non-clogging. They may be used equally well in metal, hard rubber or fiber.

	Each
FILLISTER HEAD	
Nos. 2, 3, 4, 5 and 6 each	$0.50
Nos. 7, 8, 9, 10, 12 and 14 each	.60
FLAT HEAD	
Nos. 2, 4, and 6 each	$0.50
No. 8 or 10	.60
SETS	**Per Set**
Complete Set, in a neat round wood box, with cover	$9.00
Set of 12, including Nos. 2, 4, 6, 8, 10, 12, and 14 Fillister Head and 2, 4, 6, 8, and 10, 16 Flat Head	6.60

SCREW EXTRACTORS

EZY-OUT

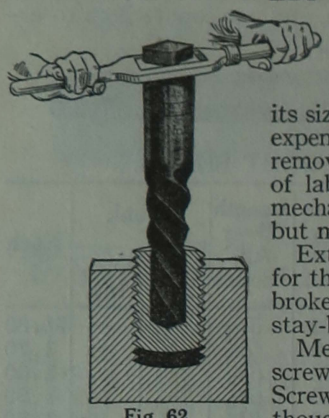

Fig. 62

For years the removal of a broken screw has been one of the meanest of all repair jobs, and in proportion to its size, it may be one of the most expensive of breaks. Heretofore its removal has often required hours of labor, principally because the mechanic has never had anything but make-shift tools for the work.

Extractor is expressly designed for the quick and easy removal of broken set and cap-screws, studs, stay-bolts, pipe fittings, etc.,

Merely drill a hole in the broken screw and insert the proper size Screw Extractor—twisting it as though tapping with a left-hand tap. The twist forces the corkscrew-like spirals to grip the sides of the drilled hole and then, as additional force is brought to bear on the tap wrench, the screw begins to "come"—after which it is an easy matter to spin it out on its own threads just as if it had never broken off at all.

The simplicity of the job is in direct contrast to the aggravations accompanying tedious methods of the past. The whole operation now need consume but a fraction of the time hitherto required, and it is accomplished without endangering the threads of the hole.

Made in 12 sizes, but for convenience and economy, these sizes are collected into handy sets, each set fitting the individual requirements of a given field of work.

Nos.	Diameter Small End, Inches	Diameter Large End, Inches	Length Flute, Inches	Length Over All, Inches	Each
1	1/16	1/8	1/2	2	$0.55
2	3/32	3/16	3/4	2 3/8	.60
3	1/8	1/4	1	2 11/16	.65
4	3/16	11/32	1 1/4	3	.75
5	1/4	7/16	1 1/2	3 3/8	.85
6	3/8	19/32	1 3/4	3 3/4	1.00
7	1/2	3/4	2	4 1/8	1.35
8	3/4	1 1/64	2 1/8	4 3/8	1.85
9	1	1 9/32	2 1/4	4 5/8	2.65
10	1 1/4	1 9/16	2 1/2	5	4.00
11	1 1/2	1 7/8	3	5 5/8	5.35
12	1 7/8	2 5/16	3 1/2	6 1/4	6.65

SCREW EXTRACTORS IN SETS

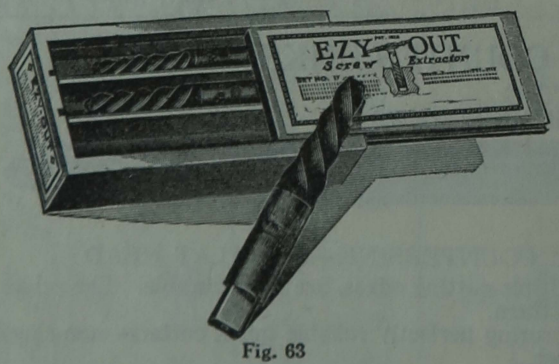

Fig. 63

	Per Set
NO. 15—Tool-Room Set, includes Extractors Nos. 1, 2, 3, 4 and 5	$3.00
NO. 16—The Heavy Shop Set, includes Extractors Nos. 6, 7, 8 and 9	6.65
NO. 17—Utility Set, includes Extractors Nos. 4, 5 and 6	2.35

Note—The best results will be obtained by using the largest Extractor possible.

HAND CHASERS FOR SCREWS

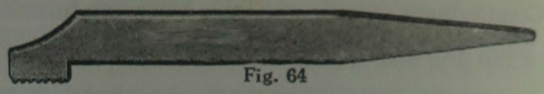

Fig. 64

INSIDE

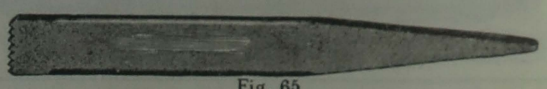

Fig. 65

OUTSIDE

These Screw Chasers have "V" threads. Cutting 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14 and 16 Threads per Inch.

Each, Inside or Outside	$0.30
Per Pair	.60

Cutting 18, 19, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38 and 40 Threads per Inch.

Each, Inside or Outside	$0.25
Per Pair	.50

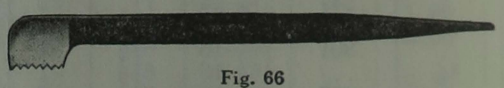

Fig. 66

NO. 723—INSIDE

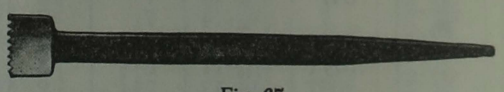

Fig. 67

NO. 725—OUTSIDE

Threads per Inch	U.S. or V Thread, Each	Whitworth Thread, Each	Threads Per Inch	U.S. or V Thread, Each	Whitworth Thread, Each
3	$0.50	$0.50	12	$0.35	....
3 1/4	.50	.50	13	.35	$0.35
3 1/2	.50	.50	14	.35	....
4	.50	.50	16	.35	.35
4 1/2	.50	.50	18	.35	.35
5	.50	.50	19	....	.35
5 1/2	.50	....	20	.35	.35
6	.50	.50	22	....	.35
7	.50	.50	24	.35	.35
8	.50	.50	26	....	.35
9	.35	.35	27	.35	....
10	.35	.35	28	.35	....
11	.35	.35	32	.35	.35
11 1/2	.35	....	....	....	....

CENTER REAMERS

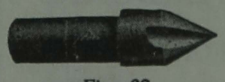

Fig. 68

Style No. 1

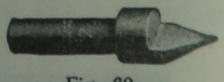

Fig. 69

Style No. 2

NO. 125A

The Included Angle is 60 degrees unless otherwise ordered.

Diameter Shank, Inches	Diameter Body, Inches	No. 1 Per Dozen	No. 1 Each	No. 2 Per Dozen	No. 2 Each
3/16	1/4	$3.60	$0.30	$3.00	$0.25
1/4	3/8	4.20	.35	3.60	.30
3/8	1/2	4.80	.40	4.20	.35
1/2	5/8	7.80	.65	7.20	.60
1/2	3/4	10.20	.85	9.60	.80

Less than one-half dozen of a size will be charged each. Special sizes made to order. Center Reamers with 72° or 82° included angle will be furnished at regular price. In ordering, give diameter of both shank and body.

COUNTERSINKS

Fig. 70

½-Inch Round Shank

NOS.	502	505	508	512
Diam. Cut, Inches	5/8	5/8	3/4	3/4
Angle	54°	82°	54°	82°
Each	$0.50	.50	.75	.75

41/64-Inch Round Shank

NOS.	503	506	509	513
Diam. Cut, Inches	5/8	5/8	3/4	3/4
Angle	54°	82°	54°	82°
Each	$0.50	.50	.75	.75

With Bit Brace Shank

NOS.	501	504	507	511
Diam. Cut, Inches	5/8	5/8	3/4	3/4
Angle	54°	82°	54°	82°
Each	$0.50	.50	.75	.75

DRILLS AND COUNTERSINKS COMBINED

Fig. 71

NO. 98—CARBON STEEL

NO. 498—HIGH SPEED STEEL

Most commonly used for centering shafts and starting drill holes at an angle. The included angle of the countersink is 60°.

Size	Diameter Body, Inches	Diameter Drills, Inches	Carbon Steel, Per Dozen	High Speed, Per Dozen
20	1/8	No. 57	$2.00	$6.00
21	13/64	No. 55	2.25	6.00
22	13/64	1/16	2.25	6.00
23	15/64	No. 49	2.50	6.00
24	15/64	No. 45	2.50	6.00
25	.302	3/32	2.75	6.00
26	.302	3/32 & 1/8	2.75	6.00
27	.302	1/8	2.75	6.00
28	7/16	5/32	3.50	9.00
29	7/16	3/16 & 5/32	3.50	9.00
30	7/16	3/16	3.50	9.00

The drills at both ends are of the same diameter except in sizes Nos. 26 and 29. Special sizes or angles made to order.

BIT STOCK COUNTERSINKS

Fig. 72

NO. 115

The included angle at point is 82 degrees. Special angles to order.

Diameter Inches	Length Over All, Inches	Each	Diameter Inches	Length Over All, Inches	Each
3/8	4 1/4	$0.50	3/4	5	$0.90
1/2	4 1/4	.60	7/8	5	1.05
5/8	4 1/4	.75	1	5	1.20

COUNTERSINKS

HIGH SPEED

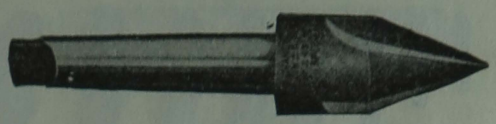

Fig. 73

Made of solid high speed steel. Cutters are relieved so as to give a very free cut and still retain great strength. Furnished with angles of 15, 37, 45 and 60 degrees, and in various diameters, lengths and numbers of taper shank. Prices furnished on receipt of specifications.

STEEL MANDRELS

HARDENED AND GROUND

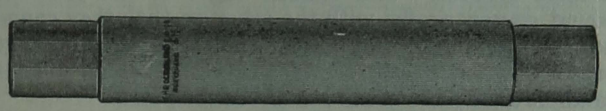

Fig. 74

NO. 143

Are made of good quality tool steel, hardened and ground perfectly true, to fit holes reamed by standard size reamers. They are slightly tapering, and the size is stamped on the large end. Are not injured by careful driving. Rawhide hammers are recommended for this purpose.

Diameter, Inches	Length, Inches	Each	Diameter, Inches	Length, Inches	Each
1/4	3 3/4	$0.80	1 15/16	10 3/4	$6.00
5/16	4	.90	2	11	6.50
3/8	4 1/4	1.00	2 1/16	11 1/2	7.00
7/16	4 1/2	1.10	2 1/8	11 1/2	7.50
1/2	5	1.20	2 3/16	12	8.00
9/16	5 1/4	1.30	2 1/4	12	8.50
5/8	5 1/2	1.40	2 5/16	12	9.00
11/16	5 3/4	1.50	2 3/8	12	9.50
3/4	6	1.60	2 7/16	12 1/2	10.00
13/16	6 1/4	1.70	2 1/2	12 1/2	10.50
7/8	6 1/2	1.85	2 9/16	12 1/2	11.25
15/16	6 3/4	2.00	2 5/8	12 1/2	12.00
1	7	2.15	2 11/16	13	12.75
1 1/16	7 1/4	2.30	2 3/4	13	13.50
1 1/8	7 1/2	2.45	2 13/16	13	14.25
1 3/16	7 3/4	2.60	2 7/8	13	15.00
1 1/4	8	2.80	2 15/16	13	15.75
1 5/16	8 1/4	3.00	3	13	16.50
1 3/8	8 1/2	3.25	3 1/8	14	18.00
1 7/16	8 3/4	3.50	3 1/4	14	19.50
1 1/2	9	3.75	3 3/8	15	21.00
1 9/16	9 1/4	4.00	3 1/2	15	23.00
1 5/8	9 1/2	4.25	3 5/8	16	25.00
1 11/16	9 3/4	4.50	3 3/4	16	27.00
1 3/4	10	4.75	3 7/8	17	29.00
1 13/16	10 1/4	5.00	4	17	31.00
1 7/8	10 1/2	5.50			

Note.—All sizes and dimensions not listed are special and subject to special prices.

EXPANDING LATHE MANDRELS

NICHOLSON

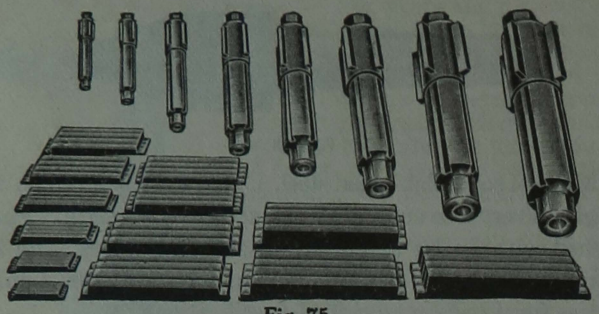

Fig. 75

These Mandrels consist of an arbor with its end turned down slightly and four flutes milled into the body, a sleeve having four narrow milled slots, and a group of four jaws; the arbor and jaws are of hardened and ground tool steel and the sleeve which merely holds the jaws in place is wrought steel. Both the flutes and the jaws are tapered and the expansion is accomplished by the jaws sliding in these grooves. The outside edges of the jaws are ground concentrically with the arbor so that they cannot show marks inside the bore. The mandrel centers are turned down perfectly round and countersunk. These mandrels are accurate and remain so for years.

NOS.	Expansion, Inches	Length Arbor, Inches	Length Jaw Bearing, Inches	Weight Each, Lbs.	Each
1X	1/2 to 9/16	5	1	1	$10.00
2X	9/16 to 21/32	6	1 1/2	1	11.00
3X	21/32 to 3/4	6	1 1/2	1	12.00
00	3/4 to 7/8	8 1/4	2	1 1/2	14.00
0	7/8 to 1	8 1/4	2	1 1/2	16.00
1	1 to 1 1/4	10	2 1/2	2 1/2	18.00
2	1 1/4 to 1 9/16	11 3/4	3	4	21.00
3	1 9/16 to 2	14 3/4	4	6 1/2	29.00
4	2 to 2 1/2	17 1/4	5	14	40.00
5	2 1/2 to 3 1/4	18 3/4	5 3/4	25	64.00
6	3 1/4 to 4	21	6	36	78.00
7	4 to 5	23 1/4	7	56	95.00
8	5 to 6	25	8	63	110.00
9	6 to 7	25	9	102	125.00

SIZES TAKEN BY EACH SET OF JAWS

NOS.	A-Jaws, Expansion, Inches	B-Jaws, Expansion, Inches	C-Jaws, Expansion, Inches
1X	1/2 to 9/16	.....	.....
2X	9/16 to 21/32	.....	.....
3X	21/32 to 3/4	.....	.....
00	3/4 to 7/8	.....	.....
0	7/8 to 1	.....	.....
1	1 to 1 1/8	1 1/8 to 1 1/4	.....
2	1 1/4 to 1 13/32	1 13/32 to 1 9/16	.....
3	1 9/16 to 1 25/32	1 25/32 to 2	.....
4	2 to 2 1/4	2 1/4 to 2 1/2	.....
5	2 1/2 to 2 3/4	2 3/4 to 3	3 to 3 1/4
6	3 1/4 to 3 1/2	3 1/2 to 3 3/4	3 3/4 to 4
7	4 to 4 11/32	4 11/32 to 4 11/16	4 11/16 to 5
8	5 to 5 11/32	5 11/32 to 5 11/16	5 11/16 to 6
9	6 to 6 11/32	6 11/32 to 6 11/16	6 11/16 to 7 1/32

Nos. 1X, 2X, 3X, 00 and 0 have but one set of jaws; Nos. 1, 2, 3 and 4 have each two sets; and Nos. 5, 6, 7, 8 and 9 have each three sets—marked A, B and C respectively.

EXPANDING LATHE MANDRELS

CHAMPION

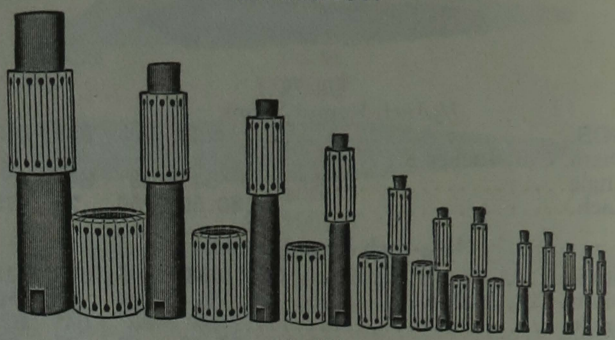

Fig. 76

Consists merely of a taper arbor and flexible sleeve; made of best grade of steel and thoroughly hardened so that it is practically invulnerable; sleeves are ground after hardening.

There are no jaws and the exterior surface so closely approximates the cylindrical form that it cannot distort or injure even thin tubes or bushings.

Work can be overhung when surfacing to prevent cutting into the mandrel; will hold work of any length of bore and will not chatter. Work is fastened and released easily and quickly.

NOS.	Range, Inches	Length Arbor, Inches	Length Sleeve, Inches	Weight Each, Lbs.	Each
1	1/2 to 9/16	5 1/2	2 1/2	5/16	$5.00
2	9/16 to 21/32	6 1/2	2 3/4	7/16	5.50
3	21/32 to 3/4	6 1/2	2 3/4	9/16	6.00
4	3/4 to 7/8	7 1/2	3 1/4	7/8	6.50
5	7/8 to 1	7 1/2	3 1/4	1 1/8	7.50
6	1 to 1 3/8	9 1/4	4	2 1/2	13.50
7	1 1/4 to 1 5/8	9 1/4	4	4	15.50
8	1 1/2 to 2	11 1/2	5	7	17.50
9	2 to 2 3/4	14 1/2	5 1/2	15	26.50
10	2 3/4 to 3 3/4	17	6	33	37.50
11	3 3/4 to 5	20	7	72	60.00
12	5 to 6 1/2	24	8	165	75.00

Packed in neat individual boxes.

Nos. 1 to 5, inclusive, have one flexible sleeve.

Nos. 6 to 12 have two flexible sleeves to obtain maximum expansion.

COMPLETE SET

	Per Set
Capacity, 1/2 to 6 1/2 Inches:	$265.00

DRIFTS AND CENTER KEYS

Fig. 77

Drop forged steel; finished and hardened.

NO. 105

NOS.	1	2	3	4
For Sockets and Sleeves, Nos.	1	2	3	4, 5, 6
Each	$0.30	.35	.40	.50

TAPER SHANK SOCKETS

These Sockets are designed to prevent the battering or upsetting of corners of drill tangs by the drift key. They are provided with a bevel in the upper surface of the drift slot giving the wedge-shaped drift flat bearing surface above and below.

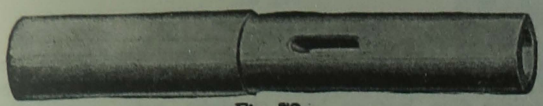

Fig. 78

NO. 100—ROUGH

Nos.	Holds Tools Inches, Inclusive	Length Over All, Inches	Diameter of Shank, Inches	Each
1	1/4 to 9/16	7 1/2	1 1/8	$1.20
2	19/32 to 29/32	8	1 1/4	1.80
3	15/16 to 1 1/4	10	1 1/2	2.50
4	1 9/32 to 2	12 1/2	2	4.00
5	2 1/16 to 3	16	2 3/4	7.50
6	3 1/16 to 4	19	3 3/4	14.00

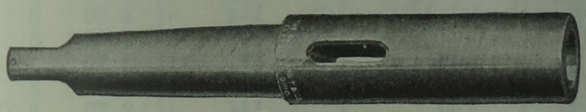

Fig. 79

NO. 102—FITTED

Nos.	Hole Nos.	Shank Nos.	Length Over All, Inches	Each
1 to 2	1	2	6 3/4	$2.00
1 to 3	1	3	7 1/2	2.50
1 to 4	1	4	8 3/4	3.20
1 to 5	1	5	10	4.80
2 to 2	2	2	7 1/2	2.50
2 to 3	2	3	8	2.50
2 to 4	2	4	9 1/4	3.20
2 to 5	2	5	10 3/4	4.80
3 to 2	3	2	8 1/4	3.20
3 to 3	3	3	9	3.20
3 to 4	3	4	10	3.20
3 to 5	3	5	11 1/2	4.80
4 to 3	4	3	10 5/8	4.80
4 to 4	4	4	11 5/8	4.80
4 to 5	4	5	12 1/2	4.80
4 to 6	4	6	16	12.00
5 to 4	5	4	13 1/8	12.00
5 to 5	5	5	14 1/2	12.00
5 to 6	5	6	16	12.00

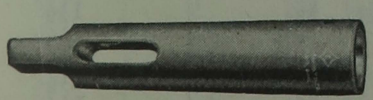

Fig. 80

NO. 104—SLEEVE OR SHELL TYPE

Size Nos.	Hole Nos.	Outside Fits Socket Nos.	Each
1 to 2	1	2	$1.80
1 to 3	1	3	2.40
1 to 4	1	4	3.00
1 to 5	1	5	4.40
2 to 3	2	3	2.40
2 to 4	2	4	3.00
2 to 5	2	5	4.40
3 to 4	3	4	3.00
3 to 5	3	5	4.40
4 to 5	4	5	4.40
4 to 6	4	6	10.00
5 to 6	5	6	10.00

COLLETS

For Use on Milling and Gear Cutting Machines, Etc.

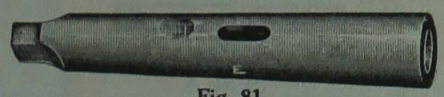

Fig. 81

STYLE NO. 1

Mark	Outside Taper	Inside Taper	Style	Collet to Spindle, Inches	Each
KK	9	7	1	3/4	$4.50
DD	10	7	1	2 5/8	5.00
E	10	7	1	1 5/8	5.00
F	10	9	1	1	5.50
Q	11	7	1	1 3/4	6.00
G	11	9	1	2 3/8	6.50
P	11	10	1	1 3/8	8.75

STYLE NO. 1A

For shanks without tenons.

A	7	4	1A	1 9/16	2.75
N	7	5	1A	2 5/16	2.75
C	9	5	1A	2 1/8	3.75
D	9	5	1A	3/8	3.50
EE	10	5	1A	2 1/8	5.00

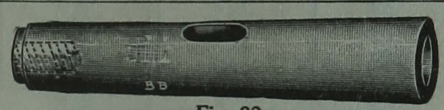

Fig. 82

STYLE NO. 2

Mark	Outside Taper	Inside Taper	Style	Collet to Spindle, Inches	Size Threaded Hole, Inches	Each
J	7	4	2	5/16	3/8-16, l.h.	$2.75
R	7	5	2	3/4	3/8-16, l.h.	2.75
K	9	5	2	3/8	7/16-14, l.h.	3.50
RR	9	7	2	7/8	7/16-14, l.h.	4.50
BB	10	7	2	1 1/4	1/2-14, l.h.	5.50
FF	10	9	2	1 1/4	1/2-14, l.h.	5.50
O	11	9	2	1/4	3/4-12, l.h.	7.00
SS	12	9	2	7/16	3/4-12, l.h.	8.25
V	12	10	2	7/8	3/4-12, r.h.	8.75
VV	12	11	2	1 7/8	3/4-12, r.h.	8.75
WW	14	10	2	7/8	3/4-12, r.h.	10.50
W	14	11	2	7/8	3/4-12, r.h.	10.50
WV	14	12	2	7/8	3/4-12, r.h.	10.50
XX	16	11	2	7/8	7/8-10, r.h.	13.50
X	16	12	2	7/8	7/8-10, r.h.	13.50
YY	18	11	2	7/8	1-10, r.h.	15.50
Y	18	14	2	7/8	1-10, r.h.	17.00

STYLE NO. 2A

No threaded hole.

Z	10	7	2A	1/2	.....	5.00

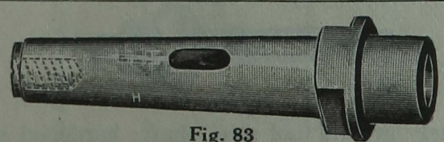

Fig. 83

STYLE NO. 3

Mark	Outside Taper	Inside Taper	Style	Collet to Spindle, Inches	Size Threaded Hole, Inches	Each
H	11	9	3	1 5/8	3/4-12, l.h.	$8.25
UU	12	9	3	1 11/16	3/4-12, l.h.	8.75

STYLE NO. 3A

No threaded hole.

GG	11	10	3A	1/2	.....	8.25
T	12	9	3A	1 11/16	.....	8.75
PP	12	10	3A	1 11/16	.....	8.75
TT	12	11	3A	1 11/16	.....	8.75

ARBORS

FOR MILLING MACHINE CUTTERS

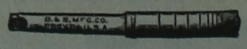

Fig. 84

Style A

NOS.	Taper Shank, Nos.	Diameter Arbor, Inches	Length, Shoulder to Nut, Inches	Each
04	7	1/2	1	$ 5.00
05	7	1/2	3	5.50
07	9	5/8	4	6.00
08	9	7/8	5 1/4	6.50
09	9	1	5 1/4	6.50
010	9	5/8	8	8.75
011	9	7/8	8	8.75
012	9	1	8	8.75
1	10	5/8	4	6.50
6	10	7/8	5 1/4	8.25
7	10	1	5 1/4	8.25
9	10	1 1/4	5 1/4	8.25
10	10	7/8	8	10.00
11	10	1	8	10.00
13	10	1 1/4	8	10.00
15	11	7/8	10 1/4	12.00
16	11	1	10 1/4	12.00
18	11	1 1/4	10 1/4	12.00

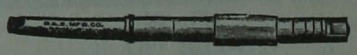

Fig. 85

Style B—with one sleeve

NOS.	Taper Shank, Nos.	Diameter Arbor, Inches	Length, Shoulder to Nut, Inches	Diameter Hardened Sleeve, Inches	Each
48	11	7/8	16 1/4	2 1/16	$18.00
49	11	1	17 3/4	2 1/16	18.00
51	11	1 1/4	20 1/4	2 1/16	20.00
52	11	1 1/2	20 1/4	2 1/16	20.00
40	10	7/8	12	1 13/16	15.50
41	10	1	12	1 13/16	15.50
43	10	1 1/4	12	1 13/16	15.50
44	10	7/8	17	1 13/16	16.50
45	10	1	17	1 13/16	16.50
47	10	1 1/4	17	1 13/16	16.50
Style C—with two sleeves					
48-A	11	7/8	16 1/4	2 1/16	20.50
49-A	11	1	17 3/4	2 1/16	20.50
51-A	11	1 1/4	20 1/4	2 1/16	22.50
52-A	11	1 1/2	20 1/4	2 1/16	22.50

STEEL LATHE ARBORS

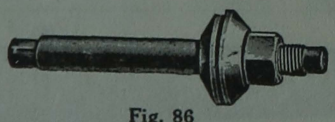

Fig. 86

Accurately ground tool steel shaft; hardened nuts and collars.

NO. 10

Size, Inches	Length Over All, Inches	Weight Each, Pounds	Each
1/4	6	7/16	$0.80
5/16	6 1/2	5/8	1.10
3/8	7	15/16	1.40
1/2	7	1 1/4	1.60
5/8	8 1/2	2	2.20
3/4	9	2 1/2	2.40
7/8	10	3	3.60
1	11	3 1/2	4.00

HOLLOW MILLS

Fig. 87

NO. 131B—PLAIN

Holes are carefully ground to size and have proper relief. Often used on short cuts immediately preceding threading dies, but on long straight cuts, especially on square stock and in cutting large headed screws from a bar they should be followed by a box tool.

Size Hole, Inches	Outside Diameter, Inches	Length Over All, Inches	Each	
			Carbon Steel	High Speed
3/32	5/8	1 1/2	$1.35	$2.75
1/8	5/8	1 1/2	1.35	2.75
5/32	5/8	1 1/2	1.35	2.75
3/16	5/8	1 1/2	1.35	2.75
7/32	5/8	1 1/2	1.35	2.75
1/4	5/8	1 1/2	1.35	2.75
9/32	3/4	1 1/2	2.00	3.00
5/16	3/4	1 1/2	2.00	3.00
11/32	3/4	1 1/2	2.00	3.00
3/8	1	1 3/4	2.70	3.25
7/16	1	1 3/4	2.70	3.25
1/2	1	1 3/4	2.70	3.25
9/16	1 1/4	2	3.00	4.25
5/8	1 1/4	2	3.00	4.25
11/16	1 1/2	2	3.35	5.25
3/4	1 1/2	2	3.35	5.25
13/16	1 1/2	2	3.35	5.25
7/8	1 3/4	2 1/4	4.00	6.50
15/16	1 3/4	2 1/4	4.00	6.50
1	1 3/4	2 1/4	4.00	6.50

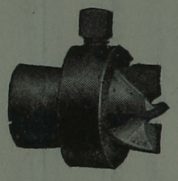

Fig. 88

NO. 131A—ADJUSTABLE

Slit and furnished with a ring which can be forced on to compensate for any slight wear.

Size Hole, Inches	Outside Diameter, Inches	Length Over All, Inches	Carbon Steel, Each
3/32	5/8	1 1/2	$1.85
1/8	5/8	1 1/2	1.85
5/32	5/8	1 1/2	1.85
3/16	5/8	1 1/2	1.85
7/32	5/8	1 1/2	1.85
1/4	5/8	1 1/2	1.85
9/32	3/4	1 1/2	2.60
5/16	3/4	1 1/2	2.60
11/32	3/4	1 1/2	2.60
3/8	1	1 3/4	3.50
7/16	1	1 3/4	3.50
1/2	1	1 3/4	3.50
9/16	1 1/4	2	4.00
5/8	1 1/4	2	4.00
11/16	1 1/2	2	4.60
3/4	1 1/2	2	4.60
13/16	1 1/2	2	4.60
7/8	1 3/4	2 1/4	5.50
15/16	1 3/4	2 1/4	5.50
1	1 3/4	2 1/4	5.50

Carbon steel mills furnished unless otherwise stated.

Hollow mills having dimensions other than listed are special and subject to special prices.

MILLING CUTTERS

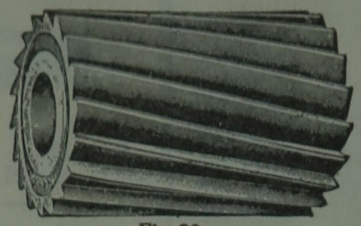

Fig. 89

Cutters of less than ¾-inch face have straight teeth.

NOS.	Diameter, Inches	Width Face, Inches	Size Hole, Inches	Carbon Steel, Each	NOS.	Diameter, Inches	Width Face, Inches	Size Hole, Inches	Carbon Steel, Each
M10	2¼	½	⅞	$2.25	M80	3	4	1¼	$8.15
M11	2¼	1	⅞	3.20	M81	3	5	1¼	9.90
M12	2¼	1¾	⅞	4.20	M82	3	6	1¼	13.70
M14	2½	3/16	1	1.65	M83	3½	3/16	1	1.85
M15	2½	¼	1	1.80	M84	3½	¼	1	2.20
M16	2½	5/16	1	2.00	M85	3½	5/16	1	2.65
M17	2½	⅜	1	2.10	M86	3½	⅜	1	3.10
M18	2½	7/16	1	2.20	M87	3½	7/16	1	3.50
M19	2½	½	1	2.30	M88	3½	½	1¼	4.00
M20	2½	9/16	1	2.40	M90	3½	⅝	1¼	4.40
M21	2½	⅝	1	2.45	M92	3½	¾	1¼	4.90
M22	2½	11/16	1	2.65	M93	3½	⅞	1¼	5.55
M23	2½	¾	1	2.80	M94	3½	1	1¼	6.10
M24	2½	13/16	1	2.90	M96	3½	1½	1¼	7.10
M25	2½	⅞	1	3.10	M98	3½	2	1¼	8.15
M26	2½	1	1	3.30	M99	3½	2½	1¼	8.75
M28	2½	1¼	1	3.70	M100	3½	3	1¼	9.40
M29	2½	1½	1	4.00	M101	3½	3½	1¼	10.35
M30	2½	1¾	1	4.35	M102	3½	4	1¼	11.60
M31	2½	2	1	4.75	M102A	3½	4	1½	11.60
M33	2½	2½	1	5.25	M104A	4	¼	1	2.60
M35	2½	3	1	5.70	M105	4	¼	1¼	2.60
M37	2½	4	1	7.00	M104B	4	5/16	1	3.20
M38	2¾	3/16	1	1.75	M106	4	5/16	1¼	3.20
M39	2¾	¼	1	2.00	M104C	4	⅜	1	3.85
M40	2¾	5/16	1	2.10	M107	4	⅜	1¼	3.85
M41	2¾	⅜	1	2.30	M108	4	7/16	1¼	4.45
M42	2¾	7/16	1	2.35	M109	4	½	1¼	5.00
M43	2¾	½	1	2.40	M111	4	9/16	1¼	5.20
M44	2¾	9/16	1	2.55	M112	4	⅝	1¼	5.45
M45	2¾	⅝	1	2.70	M114	4	¾	1¼	6.00
M45B	2¾	¾	1	3.20	M116	4	⅞	1¼	6.55
M45C	2¾	⅞	1	3.65	M117	4	1	1½	7.15
M46	2¾	1	1	4.00	M118	4	1	1¼	7.15
M48	2¾	1¼	1	4.35	M119	4	1¼	1½	7.90
M49	2¾	1½	1	4.80	M120	4	1¼	1¼	7.90
M51	2¾	2	1	5.35	M121	4	1½	1¼	8.40
M52	2¾	2½	1	5.85	M122	4	1½	1½	8.40
M53	2¾	3	1	6.40	M123	4	1¾	1¼	9.00
M55	2¾	4	1¼	7.65	M124	4	1¾	1½	9.00
M61	3	3/16	1	1.75	M125	4	2	1¼	9.45
M62	3	¼	1	2.10	M126	4	2	1½	9.45
M63	3	5/16	1	2.35	M128	4	3	1¼	11.45
M63A	3	⅜	1	2.70	M128A	4	3	1½	11.45
M64	3	⅜	1¼	2.70	M130	4	4	1¼	14.00
M65	3	7/16	1¼	2.85	M131	4	4	1½	14.00
M66	3	½	1¼	3.10	M133	4	5	1½	17.10
M67	3	9/16	1¼	3.25	M136	4	6	1½	19.65
M68	3	⅝	1¼	3.45	M142	4½	½	2	5.10
M70	3	¾	1¼	3.85	M146	4½	⅝	2	5.60
M71	3	⅞	1¼	4.20	M150	4½	¾	2	6.10
M72	3	1	1¼	4.55	M152	4½	⅞	2	6.70
M73	3	1¼	1¼	5.10	M154	4½	1	2	7.50
M74	3	1½	1¼	5.45	M156	4½	1¼	2	8.60
M75	3	1¾	1¼	5.70	M158	4½	1½	2	9.50
M76	3	2	1¼	6.00	M160	4½	1¾	2	10.45
M77	3	2½	1¼	6.60	M162	4½	2	2	10.80
M78	3	3	1¼	7.00	M163	4½	6	2	24.70
M79	3	3½	1¼	7.50					

For Cutters not listed and for High Speed Steel Cutters, prices will be furnished on application.

SIDE MILLING CUTTERS

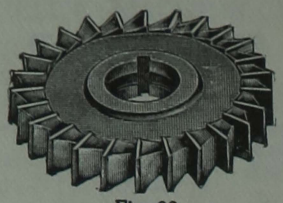

Fig. 90

These cutters are often used in pairs for sizing nuts, bolt heads, etc., and are then called "Straddle Mills."

NOS.	Diameter, Inches	Width Face, Inches	Size Hole, Inches	Carbon Steel, Each
S10	2	3/16	1/2	$2.35
S11	2	1/4	1/2	2.60
S12	2	3/8	1/2	2.80
S13	2	3/16	5/8	2.35
S14	2	1/4	5/8	2.60
S15	2	3/8	5/8	2.80
S16	2 1/2	1/4	7/8	2.80
S17	2 1/2	5/16	7/8	2.90
S18	2 1/2	3/8	7/8	3.15
S19	2 1/2	7/16	7/8	3.25
S20	2 1/2	1/2	7/8	3.40
S21	2 3/4	1/4	7/8	2.90
S22	2 3/4	5/16	7/8	3.20
S23	2 3/4	3/8	7/8	3.40
S24	2 3/4	7/16	7/8	3.50
S24A	2 3/4	7/16	1	3.50
S25	2 3/4	1/2	7/8	3.60
S25A	2 3/4	1/2	1	3.60
S26	3	1/4	1	3.15
S27	3	5/16	1	3.50
S28	3	3/8	1	3.85
S29	3	7/16	1	4.10
S30	3	1/2	1	4.30
S30A	3	1/2	1 1/4	4.30
S31	3 1/2	7/16	1	4.80
S32	3 1/2	1/2	1	5.35
S33	3 1/2	9/16	1	5.55
S34	3 1/2	5/8	1	5.80
S34A	4	1/4	1	3.70
S34B	4	3/8	1	5.15
S34C	4	3/8	1 1/4	5.15
S35	4	1/2	1	6.50
S35A	4	1/2	1 1/4	6.50
S36	4	5/8	1	7.10
S38	4	5/8	1 1/4	7.10
S39	4	3/4	1	7.65
S39A	4	3/4	1 1/4	7.65
S40	4	7/8	1	8.25
S40A	4	7/8	1 1/4	8.25
S40B	5	1/2	1	6.70
S40C	5	1/2	1 1/4	6.70
S41	5	3/4	1	8.10
S42	5	3/4	1 1/4	8.10
S42A	5	5/8	1	7.30
S42B	5	5/8	1 1/4	7.30
S43	5	7/8	1	8.75
S43A	5	7/8	1 1/4	8.75
S44	5	1	1	9.90
S44A	5	1	1 1/4	9.90
S44B	6	1/2	1	8.55
S44C	6	1/2	1 1/4	8.55
S44D	6	5/8	1 1/4	9.10
S45	6	3/4	1	9.65
S45A	6	3/4	1 1/4	9.65
S46	6	7/8	1 1/4	10.25
S47	6	1	1 1/2	11.00
S47A	6	1	1	11.00
S47B	6	1	1 1/4	11.00
S47C	7	3/4	1 1/4	17.50
S48	7	1	1 1/4	20.40
S50	8	1	1 1/4	24.75

Cutters not listed are special and subject to special prices.
Prices for High Speed Steel on Application

END MILLS

Fig. 91

Furnished right and left hand. Illustration shows left hand mill with spiral flutes.

NOS.	Diameter, Inches	Taper Nos.	Length Cut, Inches	Length Over All, Inches	Carbon Steel, Each
E10	1/4	4	13/16	2 7/16	$1.25
E11	1/4	5	13/16	3	1.45
E12	5/16	4	7/8	2 1/2	1.25
E13	5/16	5	7/8	3 1/16	1.45
E14	3/8	4	7/8	2 1/2	1.40
E15	3/8	5	7/8	3 1/16	1.55
E16	7/16	4	15/16	2 9/16	1.40
E17	7/16	5	15/16	3 1/8	1.60
E18	1/2	5	1	3 3/16	1.65
E19	1/2	7	1 1/8	5 1/8	1.80
E20	9/16	5	1 1/16	3 1/4	1.70
E21	9/16	7	1 1/4	5 1/4	2.00
E22	5/8	5	1 1/4	3 7/16	1.80
E23	5/8	7	1 1/2	5 1/2	2.15
E24	11/16	7	1 1/2	5 1/2	2.20
E26	3/4	7	1 5/8	5 5/8	2.25
E27	3/4	9	1 5/8	6 7/8	2.50
E30	7/8	7	1 3/4	5 3/4	2.65
E31	7/8	9	1 3/4	7	2.85
E34	1	7	1 7/8	5 7/8	2.70
E35	1	9	1 7/8	7 1/8	2.90
E38	1 1/8	7	2	6	2.85
E39	1 1/8	9	2	7 1/4	3.00
E42	1 1/4	7	2	6	2.85
E43	1 1/4	9	2	7 1/4	3.25
E45	1 3/8	9	2 1/8	7 3/8	3.45
E47	1 1/2	9	2 1/4	7 1/2	3.80

WITH SPIRAL FLUTES

NOS.	Diameter, Inches	Taper Nos.	Length Cut, Inches	Length Over All, Inches	Carbon, Steel, Each
E100	1/4	4	13/16	2 7/16	$1.25
E101	1/4	5	13/16	3	1.45
E102	5/16	4	7/8	2 1/2	1.25
E103	5/16	5	7/8	3 1/16	1.45
E104	3/8	4	7/8	2 1/2	1.40
E105	3/8	5	7/8	3 1/16	1.55
E106	7/16	4	15/16	2 9/16	1.40
E107	7/16	5	15/16	3 1/8	1.60
E108	1/2	5	1	3 3/16	1.65
E109	1/2	7	1 1/8	5 1/8	1.80
E110	9/16	5	1 1/16	3 1/4	1.70
E111	9/16	7	1 1/4	5 1/4	2.00
E112	5/8	5	1 1/4	3 7/16	1.80
E113	5/8	7	1 1/2	5 1/2	2.15
E114	11/16	7	1 1/2	5 1/2	2.20
E115	11/16	9	1 1/2	6 3/4	2.40
E116	3/4	7	1 5/8	5 5/8	2.25
E117	3/4	9	1 5/8	6 7/8	2.50
E120	7/8	7	1 3/4	5 3/4	2.65
E121	7/8	9	1 3/4	7	2.85
E124	1	7	1 7/8	5 7/8	2.70
E125	1	9	1 7/8	7 1/8	2.90
E128	1 1/8	7	2	6	2.85
E129	1 1/8	9	2	7 1/4	3.00
E132	1 1/4	7	2	6	2.85
E133	1 1/4	9	2	7 1/4	3.25
E135	1 3/8	9	2 1/8	7 3/8	3.45
E137	1 1/2	9	2 1/4	7 1/2	3.80
E138	1 5/8	9	2 3/8	7 5/8	4.15
E139	1 3/4	9	2 1/2	7 3/4	4.45

Prices for High Speed Steel on Application

SPIRAL SHELL END MILLS

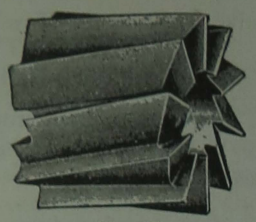

Fig. 92

NOS.	Diameter, Inches	Length Cut, Inches	No. of Arbor on which Cutter can be used	Size Hole, Inches	Carbon Steel, Each
F100	1¼	1¼		½	$3.90
F101	1 5/16	1¼	89	½	4.00
F102	1⅜	1¼	92	½	4.00
F103	1 7/16	1¼	93	½	4.10
F104	1½	1¼		½	4.10
F105	1 9/16	1¾		¾	5.00
F106	1⅝	1¾	90	¾	5.00
F107	1 11/16	1¾	94	¾	5.15
F108	1¾	1¾	96	¾	5.15
F109	1 13/16	1¾	97	¾	5.30
F110	1⅞	1¾	99	¾	5.30
F111	1 15/16	1¾	101	¾	5.45
F112	2	1¾	103	¾	5.45
F114	2⅛	1¾		¾	5.60
F116	2¼	2¼	91	1	6.20
F118	2⅜	2¼	95	1	6.35
F120	2½	2¼	98	1	6.50
F122	2⅝	2¼	100	1	6.80
F124	2¾	2¼	102	1	7.15
F126	2⅞	2¼	104	1	7.55
F128	3	2¼	105	1	8.00

In ordering, state whether right- or left-hand mills are wanted.

STRAIGHT SHANK END MILLS

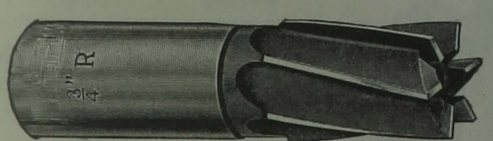

Fig. 93

Useful where it is desired to cut into work with end of mill and then move along, as in cams, grooves, etc., also when taking heavy cuts, especially in cast iron. To be used with spring collets.

Diameter of shank is same as diameter of cut.

All Mills less than ⅜ inch diameter have straight teeth.

All Mills ⅜ inch and over have spiral teeth.

NOS.	Diameter, Inches	Length Cut, Inches	Length Over All, Inches	Carbon Steel, Each
E650	⅛	5/16	1¼	$0.45
E651	5/32	5/16	1¼	.50
E652	3/16	9/16	1½	.55
E653	7/32	9/16	1½	.65
E654	¼	¾	1⅞	.70
E655	9/32	¾	1⅞	.75
E656	5/16	13/16	1 15/16	.90
E658	⅜	13/16	2	1.00
E660	7/16	⅞	2⅛	1.25
E661	½	15/16	2¼	1.60
E662	9/16	15/16	2 5/16	1.70
E663	⅝	1	2⅜	1.90
E665	¾	1⅛	2 15/16	2.15

In ordering, state whether right- or left-hand mills are wanted.

Prices for High Speed Steel on Application

ANGULAR CUTTERS

Fig. 94

These Angular Cutters of 45°, 50°, 60°, 70°, or 80° angle, both Right and Left hand, are suitable for cutting the teeth of cutters and mills.

NOS.	Diameter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each
J10	2½	½	⅞	$3.40
J11	2¾	½	1	3.60
J12	3	½	1¼	4.30

DOUBLE ANGLE CUTTERS

These cutters are carried in stock with 45°, 60°, or 90° included angle.

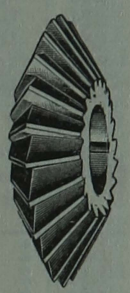

Fig. 95

NOS.	Diameter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each
J100	2½	½	⅞	$3.40
J101	2¾	½	1	3.60
J102	3	½	1¼	4.30

CUTTERS FOR SPIRAL MILLS

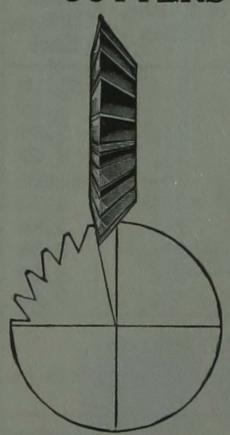

Fig. 96

These cutters are especially adapted to the cutting of spiral mills, and are made with either 40°, 48°, or 53° angle on one side and 12° on the other.

The cut illustrates a right-hand cutter at work, in the position required in cutting the teeth of a spiral cutter.

NOS.	Diameter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each
J150	2½	½	⅞	$3.40
J151	2¾	½	1	3.60
J152	3	½	1¼	4.30
*J153	3¼	½	1½	4.80

*Furnished 53° on one side and 12° on the other.

V-shaped cutters of any angle made to order.

Right- and left-hand cutters are carried in stock. In ordering, specify which kind is wanted.

Prices for High Speed Steel on Application

MILLING CUTTERS

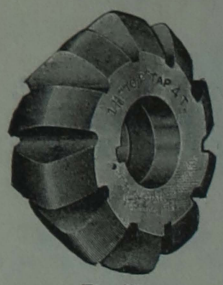

Fig. 79

FOR GROOVING TAPS AND REAMERS

Are adapted for fluting reamers, for which purpose it is necessary only to cut one or more grooves of a less depth in order to flute unevenly. These cutters can be sharpened by grinding without changing their form.

NOS.	Diameter Tap, Inches	Number Teeth in Tap	Diameter Reamer, Inches	Number Teeth in Reamer
L10	0 to 1/8	4	1/8 to 1/4	6
L11	5/32 to 1/4	4	9/32 to 3/8	6
L12	9/32 to 3/8	4	13/32 to 1/2	6
L13	7/16 to 5/8	4	17/32 to 1 1/8	6 to 8
L14	11/16 to 7/8	4	1 5/32 to 1 3/4	8 to 10
L15	15/16 to 1 1/4	4	1 25/32 to 2	10
L16	1 5/16 to 1 5/8	4	2 1/16 to 2 1/2	10
L17	1 11/16 to 2	4	2 9/16 to 3	10

NOS.	Cutter Number	Diameter of Cutter	Carbon Steel Cutters, Each	NOS.	Cutter Number	Diameter of Cutter	Carbon Steel Cutters, Each
L10	1	2	$.2.10	L14	5	2 3/8	$4.15
L11	2	2	2.45	L15	6	2 1/2	4.70
L12	3	2 1/8	3.35	L16	7	2 5/8	5.85
L13	4	2 1/4	3.60	L17	8	2 7/8	6.75

Note.—In ordering, give number of cutter or diameter of tap, to be milled.

FOR GROOVING TAPS

Do not make so deep a groove in proportion to width as tap and reamer cutters. Not suitable for fluting reamers.

NOS.	Cutter Numbers	Diameter of Tap, Inches	Diameter of Cutter, Inches	Carbon Steel Cutters, Each
L50	1	0 to 1/8	2	$2.10
L51	2	5/32 to 1/4	2	2.45
L52	3	9/32 to 3/8	2 1/8	3.35
L53	4	7/16 to 5/8	2 1/4	3.60
L54	5	11/16 to 7/8	2 3/8	4.15
L55	6	15/16 to 1 1/4	2 1/2	4.70
L56	7	1 5/16 to 1 5/8	2 5/8	5.85
L57	8	1 11/16 to 2	2 7/8	6.55
L58	9	2 1/16 to 2 7/16	3 1/8	8.10
L59	10	2 1/2 to 3	3 3/8	9.35

FOR FLUTING REAMERS

Have greater strength than form made by cutters for grooving taps and reamers.

NOS.	Cutter Number	Diameter of Reamer, Inches	Number of Teeth	Carbon Steel Cutters, Each
L75	1	1/8 to 3/16	6	$2.45
L76	2	1/4 to 5/16	6	3.10
L77	3	3/8 to 7/16	6	3.35
L78	4	1/2 to 11/16	6 to 8	3.60
L79	5	3/4 to 1	8	3.80
L80	6	1 1/16 to 1 1/2	10	3.90
L81	7	1 9/16 to 2 1/8	12	4.30
L82	8	2 1/4 to 3	14	4.80
L83	9	3 1/16 to 3 1/2	14	5.90
L84	10	3 9/16 to 5	14 to 16	7.00

Prices for High Speed Steel on Application.

MILLING CUTTERS

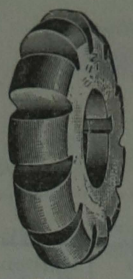

Fig. 98

CONVEX TYPE
For Milling Half Circles

These Cutters have proper clearance and can be sharpened by grinding without changing their outline.

Cutters varying from those listed are made to order.

NOS.	Diameter of Circle, Inches	Diameter of Cutter, Inches	Size of Hole, Inches	Carbon Steel Cutters, Each
C10	1/8	2	7/8	$2.10
C11	3/16	2	7/8	2.45
C12	1/4	2	7/8	3.10
C13	5/16	2 1/4	7/8	3.35
C14	3/8	2 1/4	7/8	3.45
C15	7/16	2 1/4	7/8	3.60
C16	1/2	2 1/4	7/8	3.80
C17	5/8	2 3/4	1	4.65
C18	3/4	3	1	5.50
C19	7/8	3 1/4	1	6.45
C20	1	3 1/4	1	7.00
C21	1 1/8	4	1 1/4	9.35
C22	1 1/4	4	1 1/4	9.65
C23	1 3/8	4 1/4	1 1/4	10.70
C24	1 1/2	4 1/4	1 1/4	11.00

CONCAVE TYPE
For Milling Half Circles

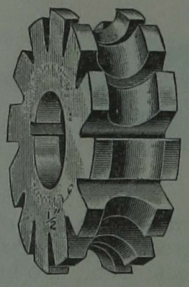

Fig. 99

These Cutters have proper clearance and can be sharpened by grinding without changing their outline.

Cutters varying from those listed are made to order.

NOS.	Diameter of Circle, Inches	Diameter of Cutter, Inches	Size of Hole, Inches	Carbon Steel Cutters, Each
C10A	1/8	2	7/8	$3.35
C11A	3/16	2	7/8	3.50
C12A	1/4	2	7/8	3.80
C13A	5/16	2 1/4	7/8	4.10
C14A	3/8	2 1/4	7/8	4.25
C15A	7/16	2 1/4	7/8	4.50
C16A	1/2	2 1/4	7/8	4.80
C17A	5/8	2 3/4	1	6.00
C18A	3/4	3	1	7.00
C19A	7/8	3 1/4	1	8.00
C20A	1	3 1/4	1	8.15
C21A	1 1/8	4	1 1/4	10.80
C22A	1 1/4	4	1 1/4	11.40
C23A	1 3/8	4 1/4	1 1/4	12.85
C24A	1 1/2	4 1/4	1 1/4	13.90

Prices for High Speed Steel on Application.

INVOLUTE CUTTERS

For Teeth of Gear Wheels

Fig. 100

Cutters, from their peculiar construction, can be sharpened by grinding faces of teeth.

Gear cutters from 2 to 8 pitch, inclusive of half numbers, can be furnished to order for the accommodation of those who require a finer division of the number of teeth to be cut with each cutter than can be cut with the regular number. All gears of same pitch cut with these cutters are interchangeable.

The Nos. 1 to 8, as listed below, are the regular cutters. Eight cutters are made for each pitch, as follows:

Cutter Nos.	Teeth Range	Cutter Nos.	Teeth Range
1	135 to Rack	5	
2	55 to 134	6	21 to 25
3	35 to 54	7	17 to 20
5	26 to 34	8	14 to 16

The half numbers are as follows:

Cutter Nos.	Teeth Range	Cutter Nos.	Teeth Range
1½	80 to 134	5½	12 to 13
2½	42 to 54	6½	19 to 20
3½	30 to 34	7½	15 to 16
4½	23 to 25		13

Pitch	Diameter of Cutter		Size of Hole, Inches	Carbon Steel, Each
	Carbon Steel, Inches	High-Speed Steel, Inches		
*1	8½	8½	2	$57.00
*1¼	7¾	7¾	2	48.00
*1½	7	7	1¾	40.50
1¾	6½	6½	1¾	30.35
2	5¾	5¾	1½	20.25
2½	5½	5¾	1½	13.90
3	4⅜	4¾	1¼	10.10
4	3⅞	4¼	1¼	7.60
5	3⅝	3¾	1¼	6.35
6	3	3⅛	1	5.45
7	2⅞	2⅞	1	5.15
8	2⅞	2⅞	1	5.00
9	2¾	2¾	1	4.70
10	2¼	2⅜	⅞	4.45
11	2¼	2⅜	⅞	4.20
12	2⅛	2¼	⅞	3.90
14	2	2⅛	⅞	3.40
16	2	2⅛	⅞	3.20
18	1⅞	2	⅞	3.00
20	1⅞	2	⅞	2.90
22	1⅞	2	⅞	2.80
24	1¾	1¾	⅞	2.65
26	1¾	1¾	⅞	2.55
28	1¾	1¾	⅞	2.25
30	1¾	1¾	⅞	2.25
32	1¾	1¾	⅞	2.25
36	1¾	1¾	⅞	2.25
40	1¾	1¾	⅞	2.25
48	1¾	1¾	⅞	2.25

Cutters marked * are not kept in stock, but are made to order.

Cutters for pitches not given in the above list will be made to order.

Prices for High Speed Steel on Application

KEYWAY CUTTERS

WOODRUFF

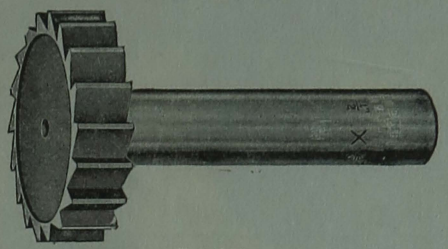

Fig. 101

Nos.	Diameter, Inches	Thickness, Inches	Shank, Inches	Carbon Steel, Each
1	½	1/16	½	$1.20
2	½	3/32	½	1.20
3	½	⅛	½	1.20
4	⅝	3/32	½	1.40
5	⅝	⅛	½	1.40
6	⅝	5/32	½	1.40
7	¾	⅛	½	1.55
8	¾	5/32	½	1.55
9	¾	3/16	½	1.55
10	⅞	5/32	½	1.75
11	⅞	3/16	½	1.75
12	⅞	7/32	½	1.75
A	⅞	¼	½	1.75
13	1	3/16	½	2.00
14	1	7/32	½	2.00
15	1	¼	½	2.00
B	1	5/16	½	2.00
16	1⅛	3/16	½	2.20
17	1⅛	7/32	½	2.20
18	1⅛	¼	½	2.20
C	1⅛	5/16	½	2.20
19	1¼	3/16	½	2.40
20	1¼	7/32	½	2.40
21	1¼	¼	½	2.40
D	1¼	5/16	½	2.40
E	1¼	⅜	½	2.40
22	1⅜	¼	½	2.70
23	1⅜	5/16	½	2.70
F	1⅜	⅜	½	2.70
24	1½	¼	½	2.70
25	1½	5/16	½	2.70
G	1½	⅜	½	2.70

Prices for High Speed Steel on Application

KEYSEAT CHUCKS

WOODRUFF

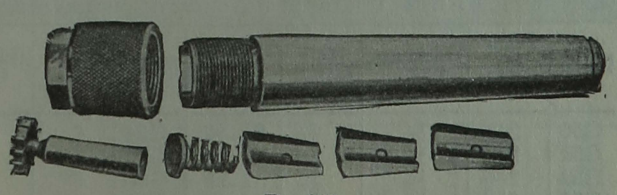

Fig. 102

Improved chuck for holding Woodruff Keyseat Cutters and other tools with ½-inch straight shanks.

This chuck is made with taper shank either B. & S. or Morse, to fit spindle. The design is such that the jaws do not fall together, but allow free entrance of the shank at all times.

Brown & Sharpe, Taper Nos....	7	9	10	11
Morse Taper, No.....	3	4	5	.....
Each.....				$15.00

Note—In ordering, specify whether Brown & Sharpe or Morse Taper is wanted.

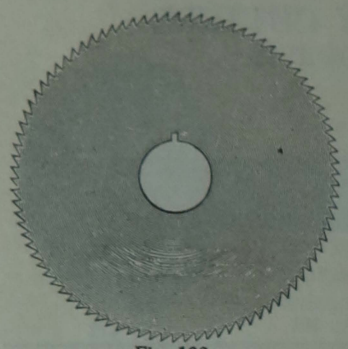

Fig. 133

SCREW SLOTTING CUTTERS

These cutters have a fine pitch of teeth especially adapted for the slotting of screw heads and similar work.

Are Cut from Crucible Steel. Teeth are accurately cut and finished. Cutters are not ground on the sides as is done with Milling Cutters and Metal Cutting Saws which are left a little thicker on the other edge than near the center for clearance.

Cutters 2¾-inch diameter have 72 teeth, 2¼-inch diameter 60 teeth, and 1¾-inch diameter 90 teeth.

NOS.	Dia. Screw Head Slotted, Inches	Ga. No., Am. Std.	Thick. Cutter, Dec. Inch	Dia. Cutter, Inches	Size Hole, Inches	Each
H10	15/16	5	.182	2¾	1	$0.90
H11	1⅛	6	.162	2¾	1	.75
H12	1	7	.144	2¾	1	.65
H13	⅞	8	.128	2¾	¾, 1	.55
H14	¾ to 13/16	9	.114	2¾	¾, 1	.50
H15	⅝	10	.102	2¾	¾, 1	.45
H16	.....	11	.091	2¾	¾, 1	.40
H17	½ to 9/16	12	.081	2¾	¾, 1	.35
H18	.....	13	.072	2¾	¾, 1	.30
H19	⅜ to 7/16	14	.064	2¾	½, ⅝, ¾, 1	.30
H20	11/32	15	.057	2¾	½, ⅝, ¾, 1	.20
H21	5/16	16	.051	2¾	½, ⅝, ¾, 1	.20
H22	.....	17	.045	2¾	½, ⅝, ¾, 1	.20
H23	¼ to 9/32	18	.040	2¾	½, ⅝, ¾, 1	.20
H24	3/16 to 7/32	19	.035	2¾	½, ⅝, ¾, 1	.20
H25	.....	20	.032	2¾	½, ⅝, ¾, 1	.20
H26	⅛	21	.028	2¾	½, ⅝, ¾, 1	.20
H27	⅛	22	.025	2¾	½, ⅝, ¾, 1	.20
H28	.....	23	.023	2¾	½, ⅝, ¾, 1	.20
H29	.....	24	.020	2¾	½, ⅝, ¾, 1	.20
H30	.....	25	.018	2¾	½, ⅝, ¾, 1	.20
H31	.....	26	.016	2¾	¾, 1	.20
H32	.....	27	.014	2¾	¾, 1	.20
H33	.....	28	.012	2¾	¾, 1	.20
H34	.....	30	.010	2¾	¾, 1	.20
H35	.....	32	.008	2¾	¾, 1	.20
H36	.....	34	.006	2¾	¾, 1	.20
H36A	.....	10	.102	2¼	⅝	.40
H36B	.....	11	.091	2¼	⅝	.35
H36C	.....	12	.081	2¼	⅝	.30
H36D	.....	13	.072	2¼	⅝	.20
H36E	.....	14	.064	2¼	⅝	.20
H36F	.....	15	.057	2¼	⅝	.20
H36G	.....	16	.051	2¼	⅝	.20
H36H	.....	17	.045	2¼	⅝	$0.20
H36I	.....	18	.040	2¼	⅝	.20
H36J	.....	19	.035	2¼	⅝	.20
H37	3/16	20	.032	2¼	⅝	.20
H38	⅛	21	.028	2¼	⅝	.20
H39	.....	22	.025	2¼	⅝	.20
H40	.....	23	.023	2¼	⅝	.20
H41	.....	24	.020	2¼	⅝	.20
H42	.....	25	.018	2¼	⅝	.20
H43	.....	26	.016	2¼	⅝	.20
H44	.....	27	.014	2¼	⅝	.20
H45	.....	28	.012	2¼	⅝	.20
H46	.....	30	.010	2¼	⅝	.20
H47	.....	32	.008	2¼	⅝	.20
H48	.....	34	.006	2¼	⅝	.20
H49	⅜	14	.064	1¾	⅝	.20
H50	11/32	15	.057	1¾	⅝	.20
H51	5/16	16	.051	1¾	⅝	.20
H52	9/32	17	.045	1¾	⅝	.20
H53	¼	18	.040	1¾	⅝	.20
H54	7/32	19	.035	1¾	⅝	.20
H55	3/16	20	.032	1¾	⅝	.20
H56	⅛	21	.028	1¾	⅝	.20
H57	.....	22	.025	1¾	⅝	.20
H58	.....	23	.023	1¾	⅝	.20
H59	.....	24	.020	1¾	½, ⅝	.15
H60	.....	25	.018	1¾	½, ⅝	.15
H61	.....	26	.016	1¾	½, ⅝	.15
H62	.....	27	.014	1¾	½, ⅝	.15
H63	.....	28	.012	1¾	½, ⅝	.15
H64	.....	30	.010	1¾	½, ⅝	.15
H65	.....	32	.008	1¾	½, ⅝	.15
H66	.....	34	.006	1¾	½, ⅝	.15

METAL SLITTING SAWS

These are thin Milling Cutters similar in appearance to screw-slotting Cutters. Are accurately ground on the sides and left a little thicker at the outer edge than near the center to give a proper clearance in cutting deep slots.

NOS.	Diam-eter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each	NOS.	Diam-eter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each	NOS.	Diam-eter, Inches	Thickness, Inches	Hole, Inches	Carbon Steel, Each
G50	2½	1/32	⅞	$1.30	G64	4	1/16	1	$1.60	G78	6	⅛	1	$3.45
G51	2½	3/64	⅞	1.20	G65	4	3/32	1	1.55	G78A	6	⅛	1¼	3.45
G52	2½	1/16	⅞	1.15	G66	4	⅛	1	1.55	G79	6	3/16	1	4.45
G53	2½	3/32	⅞	1.15	G67	4	5/32	1	1.80	G80	6	3/16	1½	4.45
G54	2½	⅛	⅞	1.15	G68	4	3/16	1	2.10	G81	7	1/16	1	9.50
G55	2½	5/32	⅞	1.40	G69	5	1/16	1	2.30	G82	7	3/32	1	5.70
G56	3	1/32	1	1.60	G70	5	3/32	1	2.00	G83	7	⅛	1	4.85
G57	3	3/64	1	1.45	G71	5	⅛	1	2.00	G83A	7	3/16	1¼	6.50
G58	3	1/16	1	1.30	G72	5	⅛	1¼	2.00	G83C	7	3/16	2	6.50
G59	3	3/32	1	1.30	G73	5	⅛	1½	2.00	G84	8	⅛	1	7.30
G60	3	⅛	1	1.30	G74	5	5/32	1	2.45	G85	8	⅛	1¼	7.30
G61	3	5/32	1	1.50	G75	5	3/16	1	2.90	G86	8	3/16	1¼	8.90
G62	4	1/32	1	2.85	G76	6	1/16	1	5.10	G87	8	3/16	1½	8.90
G63	4	3/64	1	1.85	G77	6	3/32	1	3.85					

In ordering special saws please state for what purpose they are required. **Prices for High Speed Steel on Application**

HAND TAPS

Fig. 104

TAPER

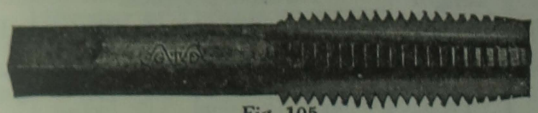

Fig. 105

PLUG

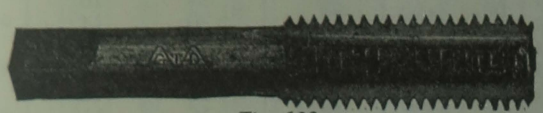

Fig. 106

NO. 302

BOTTOMING

Dia., Tap, In.	No. of Threads to the Inch			Each	Per Set
	U. S. Stand.	S.A.E. Stand.	U. S. Form		
1/16	64	...	72	$0.50	$1.50
5/64	60	...	72	.45	1.35
3/32	50	...	48	.40	1.20
7/64	48	...	...	.40	1.20
1/8	40	...	32	.35	1.05
9/64	40	...	...	.35	1.05
5/32	36	...	32	.35	1.05
11/64	32	...	...	.35	1.05
3/16	24	...	32	.40	1.20
13/64	24	...	...	.40	1.20
7/32	24	...	32	.45	1.35
15/64	24	...	...	.45	1.35
1/4	20	28	24,27,32	.45	1.35
5/16	18	24	20,27,32	.50	1.50
3/8	16	24	20, 27	.55	1.65
7/16	14	20	24, 27	.60	1.80
1/2	13	20	12,24,27	.70	2.10
9/16	12	18	27	.80	2.40
5/8	11	18	12, 27	.90	2.70
11/16	11	16	...	1.05	3.15
3/4	10	16	12, 27	1.20	3.60
13/16	10	...	...	1.40	4.20
7/8	9	14, 18	12, 27	1.60	4.80
15/16	9	...	...	1.80	5.40
1	8	14	1,2 27	2.00	6.00
1 1/8	7	12	...	2.25	6.75
1 1/4	7	12	...	2.60	7.80
1 3/8	6	12	...	3.00	9.00
1 1/2	6	12	...	3.50	10.50
1 5/8	5 1/2	...	...	4.20	12.60
1 3/4	5	...	...	5.00	15.00
1 7/8	5	...	...	5.80	17.40
2	4 1/2	...	...	6.70	20.10
2 1/8	4 1/2	...	...	8.00	24.00
2 1/4	4 1/2	...	...	9.20	27.60
2 3/8	4	...	...	10.50	31.50
2 1/2	4	...	...	11.50	34.50

Orders for hand taps to and including 11/32 inch will be filled with taps having shanks full diameter of thread. Taps 3/8 inch and larger will be furnished with shanks size of bottom of thread.

3/8 hand taps with full size shanks will be furnished at regular prices.

United States Standard threads furnished unless otherwise ordered.

S.A.E. and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

MACHINE SCREW TAPS

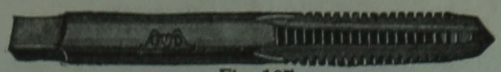

Fig. 107

NO. 305

Screw Gauge Nos.	Basic Outside Dia., Inches	Threads per Inch			Each	Per Dozen
		Standard	Special	Also Furnished		
0	.060	80	...	...	$0.50	$6.00
1	.073	72	64	56	.50	6.00
2	.086	64	56	...	.45	5.40
3	.099	56	48	...	.40	4.80
4	.112	48	36, 40	32	.40	4.80
5	.125	44	36, 40	...	.35	4.20
6	.138	40	32, 36	...	.35	4.20
7	.151	36	30, 32	...	.35	4.20
8	.164	36	30, 32	40	.35	4.20
9	.177	32	24, 30	...	.35	4.20
10	.190	30	24, 32	28	.40	4.80
12	.216	28	24	32	.45	5.40
14	.242	24	20	...	.45	5.40
16	.268	22	20	...	.45	5.40
18	.294	20	18	...	.50	6.00
20	.320	20	18	16	.50	6.00

When so ordered, the taps will be furnished in sets of taper, plug and bottoming, like hand taps.

Plug taps furnished unless otherwise specified.

STOVE BOLT TAPS

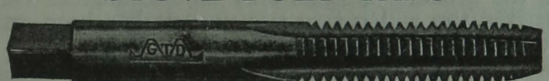

Fig. 108

NO. 310

Diameter Tap, Inches	Threads per Inch	Each	Per Dozen
3/16	24	$0.40	$4.80
1/4	18	.45	5.40
5/16	18	.50	6.00
3/8	16	.55	6.60

These taps correspond in size to American Screw Company's stove bolts. Stove bolt taps are furnished in plug style only.

STAY BOLT TAPS

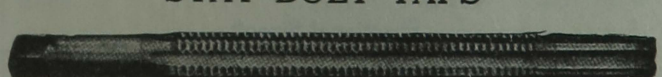

Fig. 109

Diameter, Inches	Per Inch	Diameter, Inches	Per Inch	Diameter, Inches	Per Inch
3/4	$0.40	1	$0.45	1 1/4	$0.55
13/16	.40	1 1/16	.50	1 5/16	.60
7/8	.40	1 1/8	.50	1 3/8	.60
15/16	.45	1 3/16	.55	1 7/16	.70
				1 1/2	.70

In ordering, state diameter, number of threads to the inch, length and dimensions of parts. Unless otherwise ordered these taps are furnished with twelve threads to the inch, U. S. Standard.

U. S. form, V form and Whitworth form threads supplied at same list prices. Diameter given is of the thread at its straight part.

Prices are for each inch of length 16 inches upward. Shorter taps take price of 16 inch. 20 and 24-inch lengths only are regular. Other sizes and lengths are special.

GUN TAPS

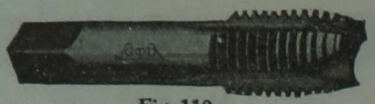

Fig. 110

The Gun Tap is radically different in design from the ordinary hand tap and offers the advantages of better quality work with increased speed and longer life.

The Gun Tap is at least twice as strong and requires not more than half as much power to drive as the ordinary tap. Therefore a Gun Tap very seldom breaks in the work. Furthermore in many cases one Gun Tap serves where formerly two and sometimes three taps were required for the operation.

The secret of the Gun Tap's phenomenal success lies in its radically different design. The cutting edges at the point of the tap are ground at an angle to the axis for a distance of three or four threads. This angle, in conjunction with the extraordinary hook of the land and the special flute form produces a long curling chip similar to that of a well ground lathe tool. This chip is not passed out through the flutes as in the ordinary tap but shoots out ahead of the tool as it progresses—hence the name Gun Tap.

Owing to the fact that the flutes are not required for the passage of chips they are made comparatively shallow leaving a very large cross-sectional area. In fact, there is as much metal in the threaded section as in the shank. This accounts for the exceptional strength of the gun tap.

All of the cutting is done by the first few teeth. The rest of the thread, acting as a lead screw, steadies the tap and produces very accurate work.

As the grinding is done only on the angular cutting edges, the tap will cut to size until it has been ground down to the last three of four teeth.

Machine Screw Sizes

Screw Gauge NOS.	Number of Threads to the Inch		Each	Screw Gauge NOS.	Number of Threads to the Inch		Each
	Std.	Also Furnished			Std.	Also Furnished	
3	56	48	$0.50	10	30	24, 28, 32	$0.40
4	48	32, 36, 40	.40	12	28	24, 32	.45
5	44	36, 40	.35	14	24	20	.45
6	40	32, 36	.35	16	22	20	.45
7	36	30, 32	.35	18	20	18	.50
8	36	30, 32, 40	.35	20	20	16, 18	.50
9	32	24, 30	.35				

Note—All of the above sizes taps are two-fluted.

Fractional Sizes*

Dia. Tap, Inch	Number of Threads		Each	Dia. Tap, Inches	Number of Threads		Each
	U. S. F.	S.A.E. Std.			U.S.F.	S.A.E. Std.	
1/8	40		$0.35	3/4	10	16	$1.20
3/16	24, 30, 32		.40	13/16	10		1.40
1/4	20, 24, 32	28	.45	7/8	9	14, 18	1.60
5/16	18, 20, 32	24	.50	15/16	9		1.80
3/8	16	24	.55	1	8	14	2.00
7/16	14	20	.60	1 1/8	7	12	2.25
1/2	13	20	.70	1 1/4	7	12	2.60
9/16	12	18	.80	1 3/8	6	12	3.00
5/8	11	18	.90	1 1/2	6	12	3.50
11/16	11	16	1.05				

Note. Sizes 1/8 to 3/8 inch are two-fluted; sizes 7/16 to 13/16 inch are three fluted; sizes 7/8 inch and larger are four-fluted.

*Also furnished in British Standard fine thread 1/4 to 1 inch.

NUT TAPS

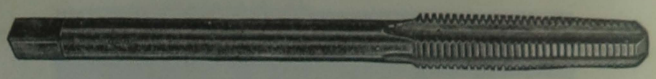

Fig. 111

Dia. Tap, Ins.	Length Over All, Inches	Threads, per Inch.			Each
		U. S. Std.	S. A. E. Std.	Whit. Std.	
3/16	4 1/2	24, 32	..	24	$ 0.60
1/4	5	20	28	20	.60
5/16	5 1/2	18	24	18	.70
3/8	6	16	24	16	.80
7/16	6 1/2	14	20	14	.90
1/2	7	13	20	12	1.00
9/16	7 1/2	12	18	12	1.15
5/8	8	11	18	11	1.35
11/16	8 1/2	11	16	11	1.60
3/4	9	10	16	10	1.85
13/16	9 1/2	10	..	10	2.15
7/8	10	9	14, 18	9	2.45
15/16	10 1/2	9	..	9	2.80
1	11	8	14	8	3.15
1 1/8	11 1/2	7	12	7	3.70
1 1/4	12	7	12	7	4.50
1 3/8	12 1/2	6	12	6	5.50
1 1/2	13	6	12	6	6.75
1 5/8	13 1/2	5 1/2	..	5	8.00
1 3/4	14	5	..	5	9.25
1 7/8	14 1/2	5	..	4 1/2	10.75
2	15	4 1/2	..	4 1/2	12.25
2 1/8	15 1/2	4 1/2	..	4 1/2	14.00
2 1/4	16	4 1/2	..	4	15.75
2 3/8	16 1/2	4	..	4	17.75
2 1/2	17	4	..	4	20.00

United States Standard threads furnished unless otherwise ordered.

S. A. E. and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

TAP EXTENSIONS

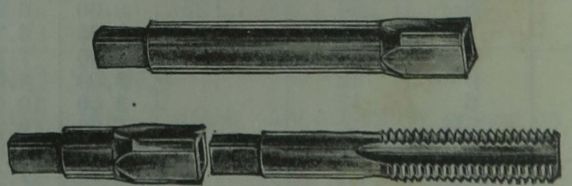

Fig. 112

Made of tool steel carefully hardened and tempered. Consists of two pieces—4 and 6 inches long and may be used on all standard taps from 1/4 to 1 inch.

For Taps, Inches	1/4	5/16	3/8	7/16
Size of Tap Shank, Inches	.192	.240	.206	.240
Size Hole Tap Extension, Inches	.192	.240	.206	.240
Per Set (3 Pieces)	$2.00	2.25	2.25	2.25

For Taps, Inches	1/2	5/8	3/4	7/8	1
Size of Tap Shank, Inches	.280	.357	.440	.522	.595
Size Hole Tap Extension, Inches	.280	.357	.440	.522	.595
Per Set (3 Pieces)	$2.50	3.00	3.50	4.00	5.00

TAPPER TAPS

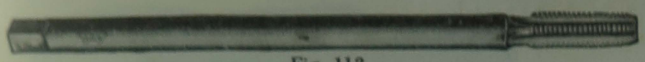

Fig. 113

Designed for use in tapping machines.

NO. 307

Dia. Tap, Ins.	Number of Threads Per Inch			Length Over All, Inches			
	U. S. Std.	S.A.E. Std.	Whit. Std.	11 Each	12 Each	14 Each	15 Each
1/4	20	28	20	$0.70	$0.75	$0.80	$0.90
5/16	18	24	18	.80	.85	.90	1.00
3/8	16	24	16	.90	.95	1.00	1.10
7/16	14	20	14	1.00	1.05	1.15	1.25
1/2	13	20	12	1.10	1.15	1.25	1.35
9/16	12	18	12	1.30	1.35	1.45	1.55
5/8	11	18	11	1.45	1.50	1.65	1.75
11/16	11	16	11	1.65	1.70	1.80	1.95
3/4	10	16	10	1.90	1.95	2.00	2.10
13/16	10	..	10	2.15	2.20	2.25	2.35
7/8	9	14, 18	9	2.45	2.50	2.60	2.75
15/16	9	..	9	2.80	2.90	3.00	3.15
1	8	14	8	3.15	3.30	3.50	3.65
1 1/8	7	12	7	3.60	3.70	4.00	4.15
1 1/4	7	12	7	4.20	4.50	4.90	5.10
1 3/8	6	12	6	4.80	5.15	5.75	6.00
1 1/2	6	12	6	5.75	6.25	7.05	7.35
1 5/8	5 1/2	..	5	6.40	6.95	8.00	8.35
1 3/4	5	..	5	7.40	8.00	9.25	9.65
1 7/8	5	..	4 1/2	8.25	8.90	10.15	10.75
2	4 1/2	..	4 1/2	9.10	9.90	11.50	12.25

Specify size, length, form of thread and style shank.

United States Standard threads furnished unless otherwise ordered.

S. A. E. and Whitworth Standard threads furnished at regular prices if specified.

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

PULLEY TAPS

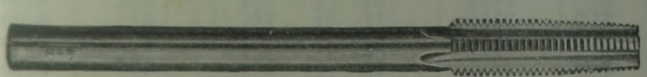

Fig. 114

Pulley Taps are a special type of hand taps provided with a long shank to enable the tapping of holes that are difficult to reach, such as the set-screw and oil-cup holes in pulley hubs. The tap is usually run through a hole in the pulley rim and as this hole is made to fit the tap shank more or less closely it affords a means of correctly aligning and steadying the tap in starting the thread.

NO. 308

Dia. Tap, Inch	Threads per Inch, U. S. Standard	Length Over All, Inches				
		6 Each	8 Each	10 Each	12 Each	14 Each
1/4	20	$.65	$.70	....	....	....
5/16	18	.70	.75	....	....	....
3/8	16	.80	.85	$.90	$.95	$1.00
7/16	14	.85	.95	1.00	1.05	1.15
1/2	13	.95	1.05	1.10	1.15	1.25
9/16	12	1.00	1.15	1.25	1.35	1.45
5/8	11	1.00	1.35	1.40	1.50	1.65
3/4	10	....	....	1.85	1.95	2.00

Sizes, lengths and threads not listed are subject to special prices.

Left hand taps are special.

TAP AND REAMER WRENCHES

ADJUSTABLE

Fig. 115

NOS.	Capacity (Tap Sizes) Hand, Inches	Mach. Screw	Pipe, Inch	Length, Inches	Weight Each, Lbs.	Each
00	1/16 to 3/16	0 to 13	.....	5	1/9	$1.25
0	1/16 to 1/4	0 to 18	.....	7	1/4	1.50
4	1/16 to 3/8	0 to 24	1/8	9	7/16	1.75
5	3/16 to 1/2	10 to 30	1/8 to 1/4	11	3/4	2.00
6	1/4 to 3/4	14 to 30	1/8 to 3/8	15	2	2.50
7	3/8 to 1	15 to 30	1/8 to 3/4	19	3 1/2	3.50
7 1/2	3/8 to 1 1/4	22 to 30	1/4 to 3/4	31	4 1/2	6.50
8	3/4 to 1 1/2	.....	3/8 to 1	40	8	8.00

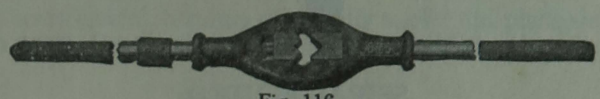

Fig. 116

NOS.	Capacity (Tap Sizes) Hand, Inches	Mach. Screw	Pipe, Inches	Length, Inches	Weight Each, Lbs.	Each
22	1 to 2 5/8	.....	1 to 2	55	12	$15.00
24	1 3/4 to 4	.....	2 to 4	74	25	25.00

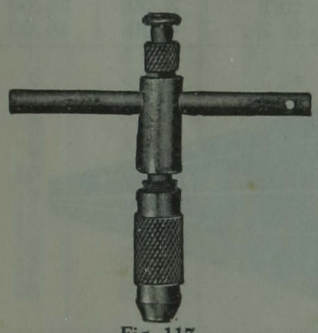

Fig. 117

ALERT—RATCHET

Will tap, ream or drill holes in out-of-the-way corners; combines rigidity of solid tool and flexibility of ratchet. Change can be made without removing hand from natural tapping position; no pins or pawls used. Fine or coarse feeds as desired obtained instantly. Knurled upper sleeve permits quick and accurate starting of taps and quick backing out. Jaws are finely tempered and broached square on inside to insure firm grip and proper chucking of tap. All exposed parts of wrench are polished and given a blue finish.

NOS.	1	2	3
Length over all, inches	3	3 3/4	5 3/16
Capacity, inches	1/16–3/16	1/8–5/16	3/16–1/2
Each	$2.00	2.00	2.50

ADJUSTABLE

Four jaw chuck with knurled sleeve; solid steel T handle; machined and polished.

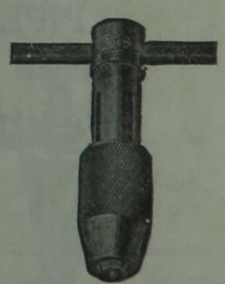

Fig. 118

NOS.	Capacity (Tap Size) Hand, Inch	Mach. Screw	Pipe, Inch	Length, Inches	Weight Each, Ounces	Each
329	1/16 to 9/32	0 to 18	.....	2 1/2	3	$0.50
333	5/16 to 1/2	14 to 30	1/8	3 5/8	8	1.00

BURRING REAMERS

These burring reamers are made of finest steel and designed especially for removing burrs, caused by cutting pipe.

They are also extensively used for countersinking.

Great care is taken in grinding these tools to adapt them for use in a variety of materials.

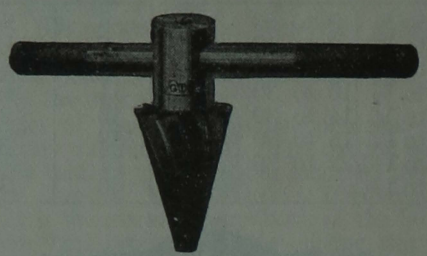

Fig. 119

SPIRAL FLUTED

NOS.	Style of Shank	Capacity Pipe, Inches	Each	Per Dozen
241	Bit Brace	⅛ to ½	$1.00	$12.00
242	Bit Brace	¼ to 1	1.25	14.00
242½	Bit Brace	¼ to 1¼	1.50	17.00
243	½ Round	¼ to 1¼	1.50	17.00
244	Bit Brace	½ to 2	3.00	36.00
246	T Handle	½ to 2	4.00	48.00

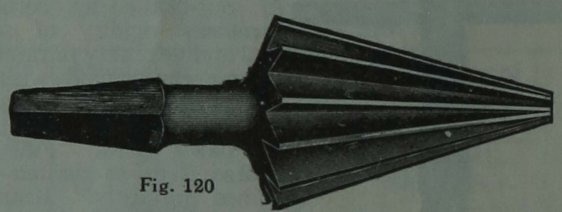

Fig. 120

STRAIGHT FLUTED

NOS.	Style of Shank	Capacity Pipe, Inches	Each	Per Dozen
1	Bit Brace	¼ to 1¼	$1.50	$17.00
2	Bit Brace	¼ to 2	3.00	36.00

PIPE END REAMERS

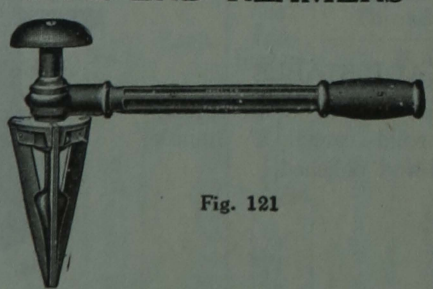

Fig. 121

No. 1 is plain as illustrated; No. 2 has a ratchet so constructed that the strain is divided into half a dozen bearings, greatly increasing the durability of the tool.

NOS.	1	2
Capacity, Inches	⅜ to 3	⅜ to 3
Each	$5.00	7.50

COMBINED PIPE TAPS AND DRILLS

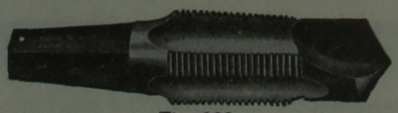

Fig. 122

FOR GAS AND WATER PIPES

Size, Inches	Length, Inches	Dimensions Shank, Inches	Each
¼	3¾	½x11/16x1¾	.....
⅜	4	½x11/16x1¾	.....
½	4¼	½x11/16x1¾	.....
¾	4½	½x11/16x1¾	.....
1	4¾	½x11/16x1¾	.....
1¼	5	½x11/16x1¾	.....
1½	5½	½x11/16x1¾	.....
2	5¾	¾x 1x2	.....
2½	6½	¾x 1x2	.....

Prices on application

PIPE TAPS

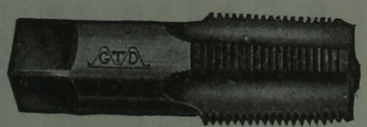

Fig. 123

A high grade pipe tap made from selected crucible tool steel.

Pipe Size, Ins.	No. Threads, Inch		Length of Thread Inches	Length Over All, Inches	Straight or Taper Each
	Briggs Std.	Whit. Std.			
⅛	27	28	¾	2⅛	$1.00
¼	18	19	1 1/16	2 7/16	1.20
⅜	18	19	1 1/16	2 9/16	1.60
½	14	14	1⅜	3⅛	2.00
⅝	....	14	1⅜	3 3/16	2.80
¾	14	14	1⅜	3¼	2.80
⅞	....	14	1 9/16	3½	4.40
1	11½	11	1¾	3¾	4.40
1¼	11½	11	1¾	4	5.00
1½	11½	11	1¾	4¼	6.60
1¾	....	11	1¾	4⅜	8.00
2	11½	11	1¾	4½	10.00

Briggs Standard right hand pipe taps are furnished unless otherwise specified. British (Whitworth) right hand threads furnished at regular prices.

Sizes, lengths and threads not listed are special.

TAPER PIPE REAMERS

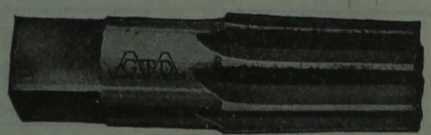

Fig. 124

Pipe Size, Inches	Length Over All, Inches	Each	Pipe Size, Inches	Length Over All, Inches	Each
⅛	2⅛	$1.00	⅞	3½	$4.40
¼	2 7/16	1.20	1	3¾	4.40
⅜	2 9/16	1.60	1	3¾	4.40
½	3⅛	2.00	1¼	4	5.00
⅝	3 3/16	2.80	1½	4¼	6.60
¾	3¼	2.80	1¾	4⅜	8.00
			2	4½	10.00

ADJUSTABLE DIES

LITTLE GIANT—REVERSIBLE

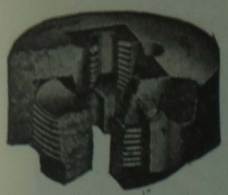
Fig. 125

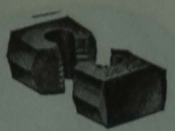
Fig. 126

Fig. 127

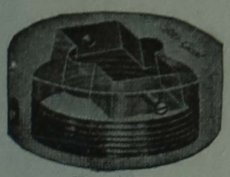
Fig. 128

The die proper is in two pieces, each half having two cutting edges. The die can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel.

The die is held in a cap. The edges of the die are beveled to the same angle as the beveled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is beveled on both sides to permit reversing the die so that work may be threaded either through the guide or from the face, determined by the character of the work.

After the die is laid in the slot in the cap, a screw-guide wedges it tight. The die is thus held in a three angle grip, the surest grip known to the science of mechanics. It cannot tilt out of alignment.

When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal. Yet it is easily taken apart, the die sharpened, and reassembled.

Fractional Sizes

Cutting Sizes, Inches	Threads per Inch U.S.	Whit.	Also Furnished U.S. Form	For Collets 1¼,'1⅝, †2, 2¾, 4, 4½ Inches Dies, Each	Dies, Each	Dies, Each
1/16	64	60	72	$0.75	.....	.....
5/64	60	.....	72	.75	.....	.....
3/32	50	48	48, 56	.75	.....	.....
7/64	48	.....	56	.75	.....	.....
1/8	40	40	32	.75	.....	.....
9/64	40	.....	.....	.75	.....	.....
5/32	36	32	32	.75	.....	.....
11/64	32	.....	.....	.75	.....	.....
3/16	24	24	30, 32	.75	.....	$1.00
13/64	24	.....	.....	.75	.....	1.00
7/32	24	24	32	.75	.....	1.00
15/64	24	.....	.....	.75	.....	1.00
1/4	20	20	24, 32	.75	$1.00	1.00
5/16	18	18	20, 32	.....	1.00	1.00
3/8	16	16	20	.....	1.25	1.25
7/16	14	14	24	.....	.....	1.25
1/2	13	12	12, 24	.....	.....	1.50
9/16	12	12	.....	.....	.....	1.50
5/8	11	11	12	.....	.....	1.75
11/16	11	11	.....	.....	.....	1.75
3/4	10	10	12	.....	.....	2.00
13/16	10	10	.....	.....	.....	2.00
7/8	9	9	12	.....	.....	2.75
15/16	9	9	.....	.....	.....	2.75
1	8	8	12	.....	.....	2.75
1⅛	7	7	.....	.....	.....	4.00
1¼	7	7	.....	.....	.....	4.00
1⅜	6	6	.....	.....	.....	5.00
1½	6	6	.....	.....	.....	5.00

†Note.—2-inch diam. collets take die sizes 3/16-½ inch incl.
2-¾inch diam. collets take die sizes 3/16-1 inch incl.
4-inch diam. collets take die sizes 5/8-1¼ inches incl.
4½-inch diam. collets take die sizes 13/16-1½ inches incl.

In ordering dies specify outside diameter of collet.

United States Standard threads furnished unless otherwise specified.

V-threads oversize can be furnished if ordered but are not recommended.

Dies for threading pipe or tubing can be furnished on order.

Sizes, dimensions and threads not listed are subject to special prices. Left-hand dies are special.

Machine Screw Sizes

Screw Gauge NOS.	Threads per Inch A.S.M.E. Standard	Also Furnished	For Collets 1¼ Inch Dies, Each	1⅝ Inch Dies, Each
2	64	56	$0.75	.....
3	56	48	.75	.....
4	48	36, 40	.75	.....
5	44	36, 40	.75	.....
6	40	32, 36	.75	.....
7	36	30, 32	.75	.....
8	36	30, 32	.75	.....
9	32	24, 30	.75	.....
10	30	24, 32	.75	.....
12	28	24	.75	.....
14	24	20	.75	$1.00
16	22	20	.75	1.00
18	20	18	.....	1.00
20	20	18	.....	1.00

COLLETS FOR LITTLE GIANT DIES

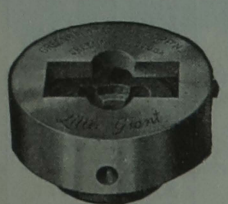
Fig.129

A Collet consists of a Cap and a Guide.

Collet or Stock NOS.	Diam. Collet, Inches	Sizes Dies	Each Cap	Guide	Collet Complete	Length Stock, Inches	Stock, Each
A1	1¼	{2 -16 / 1/16-9/32}	$0.25	$0.15	$0.40	7½	$1.00
A10	1⅝	{14 -24 / 1/4-3/8}	.30	.20	.50	13½	1.25
1	2	¼-½	.30	.20	.50	14½	1.50
5	2¾	¼-1	.50	.20	.70	23	3.00
7	2¾	¼-1	.50	.20	.70	26	3.00
9	2¾	½-1	.50	.20	.70	29	3.00
20	4	5/8-1¼	1.00	.50	1.50	40	6.00
25	4½	7/8-1½	1.50	.50	2.00	52	8.00

ADJUSTABLE DIES

LIGHTNING

Reversible

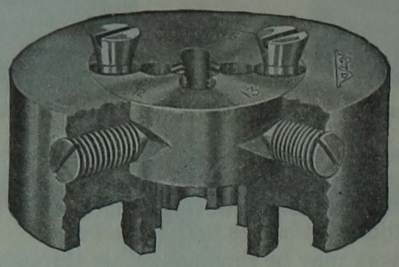

Fig. 130

Round, two-piece die, supplied with its collet for use in the single die stock, or without collet when used in full mounted stocks.

The die is secured in the collet or the stock by means of two interior taper head screws and four exterior set screws.

Loosening the set screws and removing the taper head screws permit the die to be removed for sharpening.

Adjustment is effected and maintained by turning the interior screws, checking the die halves against them by means of the set screws in the side.

The lower half of the collet forms a guide for the die, insuring its being started squarely on the bar.

Size, Inches	Size of Dies, Inches		Each	Collets without Dies, Outside Diameter		
	Outside Dia.	Thickness		2 3/16 Inches, Each	2 3/4 Inches, Each	4 1/4 Inches, Each
3/16	1 7/16	1/2	$1.00	$0.50	$0.50	....
1/4	1 7/16	1/2	1.00	.50	.50	....
5/16	1 7/16	1/2	1.00	.50	.50	....
3/8	1 7/16	1/2	1.15	.50	.50	....
7/16	1 11/16	9/16	1.30	.50	.50	....
1/2	1 11/16	9/16	1.50	.50	.50	....
9/16	1 15/16	5/8	1.60	....	.50	....
5/8	1 15/16	5/8	1.75	....	.50	....
11/16	2 3/16	11/16	1.90	....	.50	....
3/4	2 3/16	11/16	2.00	....	.50	....
13/16	2 3/16	7/8	2.25	....	.50	....
7/8	2 3/16	7/8	2.50	....	.50	$1.00
15/16	2 3/16	1	2.75	....	.50	1.00
1	2 3/16	1	3.00	....	.50	1.00
1 1/8	2 7/16	1 1/8	3.50	....	....	1.00
1 1/4	2 11/16	1 1/4	4.00	....	....	1.00
1 3/8	2 15/16	1 3/8	4.50	....	....	1.00
1 1/2	2 15/16	1 1/2	5.00	....	....	1.00

2 3/16 inches diameter collets used in screw plates Nos. 2025, 1204, 2351, metric sets Nos. 3025, 3351.

2 3/4 inches diameter collets used in screw plates Nos. 1189, 1193, 1195, 1197, 1199, 1204, 1205, 1207, 2353, 2359, metric sets Nos. 3199, 3353, 3359.

4 1/4 inches diameter collets used in screw plates Nos. 1200, 1205.

United States Standard form of thread furnished unless otherwise specified.

Sizes, dimensions and threads not regular are subject to special prices. Left-hand dies are special.

ADJUSTABLE DIES

GREEN RIVER

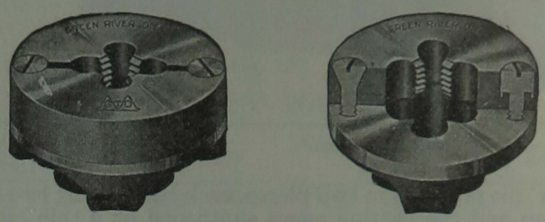

Fig. 131

A round, two-piece die, extremely simple in construction and requiring no collet.

The die is fastened to a base which forms a guide for the work to be cut.

The two halves of the die are hinged together by a cup-head screw, which, with the taper-head adjusting screw, holds the die and guide together.

The die may be adjusted to size, without removal from stock or holder, by turning the taper-head screw in, to open, and out, to close.

While these dies are intended to cut from the side next the guide, they are also slightly chamfered on the face side to enable them to cut close to shoulder.

Cutting Sizes	Diameter of Die, Inches				
	7/8, Each	1 1/2, Each	2 3/16, Each	2 3/4, Each	3 7/16, Each
M. S. Inches 1–18	$1.00	....	....	....	....
1/16	1.00	....	....	....	....
5/64	1.00	....	....	....	....
3/32	1.00	....	....	....	....
7/64	1.00	....	....	....	....
1/8	1.00	$1.25	....	....	....
9/64	1.00	1.25	....	....	....
5/32	1.00	1.25	....	....	....
11/64	1.00	1.25	....	....	....
3/16	1.00	1.25	$1.25	$1.25	....
13/64	1.00	1.25	1.25	1.25	....
7/32	1.00	1.25	1.25	1.25	....
15/64	1.00	1.25	1.25	1.25	....
1/4	1.00	1.25	1.25	1.25	....
5/16	....	1.25	1.25	1.25	....
3/8	....	1.25	1.50	1.50	....
7/16	....	1.25	1.50	1.50	....
1/2	....	1.25	1.50	1.50	....
9/16	....	....	1.60	1.60	....
5/8	....	....	1.75	1.75	....
11/16	....	....	1.90	1.90	....
3/4	....	....	2.00	2.00	....
13/16	....	....	2.25	2.25	....
7/8	....	....	2.50	2.50	$2.50
15/16	....	....	2.75	2.75	2.75
1	....	....	3.00	3.00	3.00
1 1/8	....	....	....	3.50	3.50
1 1/4	....	....	....	4.00	4.00
1 3/8	....	....	....	....	4.50
1 1/2	....	....	....	....	5.00
Guides Extra	*	.40	.40	.40	.50

*7/8 Inch die furnished complete with guide. Not sold separately.

United States Standard threads furnished unless otherwise ordered.

Sizes, dimensions and threads not regular are subject to special prices. Left-hand dies are special.

BUTTON DIES

ROUND ADJUSTABLE

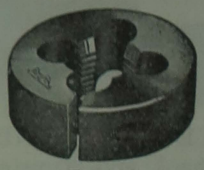

Fig. 132

The round adjustable split die is made from one piece of steel, carefully hobbed, split on one side to provide means of adjusting; spring tempered on the opposite side.

Adjusted by a fine pitch screw, in the split side, which forces the teeth away from the center, or allows them to spring together.

Abundant chip room is provided.

Machine Screw Sizes

Screw Gage NOS.	Threads, Per Inch		Outside Diameter, Inches *		
	A.S.M.E. Standard	Also Furnished	5/8, Each	13/16, Each	1, Each
0	80		$0.80	$0.90	..
1	72	56, 64	.80	.90	..
2	64	56	.70	.80	..
3	56	48	.60	.70	..
4	48	32, 36, 40	.50	.60	..
5	44	36, 40	.50	.60	..
6	40	32, 36	.50	.60	$0.75
7	36	30, 32	.50	.60	.75
8	36	30, 32, 40	.50	.60	.75
9	32	24, 30	.50	.60	.75
10	30	24, 28, 32	.50	.60	.75
12	28	24, 32	.50	.60	.75
14	24	20	.50	.60	.75
16	22	20	..	.60	.75
18	20	18	..	.60	.75
20	20	16, 18	..	.60	.75

Fractional Sizes

Cutting Size, Inches	Number of Threads per Inch			Outside Diameter, Inches *		
	Standard Pitches U. S.	Whitworth	Also Furnished U. S. Form	5/8, Each	13/16, Each	1, Each
1/16	64	60	72	$0.80	$0.90	..
5/64	60	..	72	.70	.80	..
3/32	50	48	56	.60	.70	..
7/64	48	..	..	.50	.60	..
1/8	40	40	32	.50	.60	$0.75
9/64	40	..	..	.50	.60	.75
5/32	36	32	32	.50	.60	.75
11/64	32	..	..	.50	.60	.75
3/16	24	24	32	.50	.60	.75
13/64	24	..	..	.50	.60	.75
7/32	24	24	32	.50	.60	.75
15/64	24	..	..	.50	.60	.75
1/4	20	20	24, 27, 32	.50	.60	.75
5/16	18	18	20, 27, 32	..	.60	.75
3/8	16	16	20, 27	..	..	.75
7/16	14	14	20, 27	..	..	.75

* 5/8 Inch Outside Diameter is 1/4 Inch Thick.
13/16 Inch Outside Diameter, 9/32 Inch Thick.
1 Inch Outside Diameter, 3/8 Inch Thick.

U. S. Standard threads furnished unless otherwise ordered.

Sizes, dimensions and threads not listed are subject to special prices.

Left hand dies are special.

Specify whether for hand or machine use.

HEXAGON RETHREADING DIES

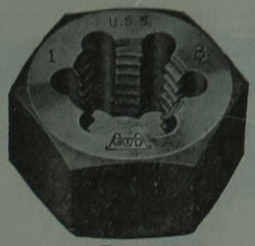

Fig. 133

These dies are used for repair work, and for dressing over bruised or rusty threads. They can be used in bit-brace sockets, ratchet or monkey-wrenches. Accurate and durable.

Cutting Size, Inches	Threads, Per Inch			Size Die, Inches		Each
	U. S. Std.	S. A. E. Std.	Whit. Std.	Across Flats	Thickness	
1/4	20	28	20	19/32	1/4	$0.60
5/16	18	24	18	11/16	5/16	.65
3/8	16	24	16	25/32	3/8	.70
7/16	14	20	14	7/8	7/16	.75
1/2	13	20	12	1 1/16	1/2	.80
9/16	12	18	12	1 1/16	1/2	.85
5/8	11	18	11	1 1/4	5/8	.90
11/16	11	16	11	1 7/16	3/4	.95
3/4	10	16	10	1 7/16	3/4	1.00
7/8	9	14	9	1 5/8	7/8	1.10
1	8	14	8	1 13/16	1	1.20
1 1/8	7	12	7	2	1	1.40
1 1/4	7	12	7	2 3/16	1	1.60
1 3/8	6	12	6	2 3/8	1	1.80
1 1/2	6	12	6	2 9/16	1	2.00

U. S. Standard threads furnished unless otherwise ordered.

SOLID SQUARE BOLT DIES

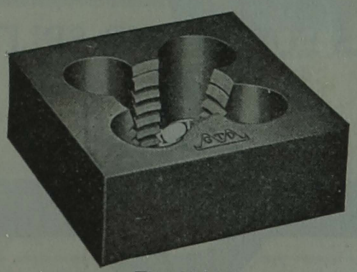

Fig. 134

Dies 1/4 to 7/16 inch, 1/2 inch thick; 1/2 to 15/16 inch, 3/4 inch thick; 1 to 1 5/8 inches, 1 inch thick; 1 3/4 inches, 1 1/4 inches thick; 1 7/8 inches, 1 1/2 inches thick; 2 inches, 2 inches thick.

Cutting Size, Inches	No. of Threads Per Inch	Size of Square, Inches	Each	Cutting Size, Inches	No. of Threads Per Inch	Size of Square, Inches	Each
1/4	20	2 1/2	$1.80	15/16	9	2 1/2	$2.55
5/16	18	2 1/2	1.80	1	8	2 1/2	2.70
3/8	16	2 1/2	1.80	1 1/8	7	2 1/2	3.00
7/16	14	2 1/2	1.80	1 1/4	7	2 1/2	3.30
1/2	13	2 1/2	1.80	1 3/8	6	2 1/2	3.60
9/16	12	2 1/2	1.90	1 1/2	6	3	3.90
5/8	11	2 1/2	2.00	1 5/8	5 1/2	3	4.20
11/16	11	2 1/2	2.10	1 3/4	5	3	5.40
3/4	10	2 1/2	2.20	1 7/8	5	3 1/2	6.50
13/16	10	2 1/2	2.30	2	4 1/2	3 3/4	7.50
7/8	9	2 1/2	2.40				

U. S. Standard threads will be furnished.

Sizes, dimensions and threads not listed are subject to special prices.

Left-hand dies are special.

STOCKS FOR SCREW PLATES

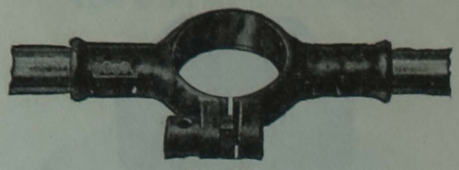

Fig. 135

Fig. 136

ELASTIC

Regularly furnished with Lightning and Green River single stock screw plates. Stocks are provided with an opening and closing device which firmly holds the collets, prevents their sticking and facilitates their removal. It is never necessary to drive a die out or force it into the stock. Adjustment is obtained by a screw with a right and left-hand thread, in connection with a washer, which tightens or loosens the grip on the collet. If a die has been adjusted "wide," the stock itself can be opened wider by backing out the adjusting screw with the turning pin. This causes the washer to spread the opening.

NOS.	Dia. Opening, Inches	Lgth., Ins.	Each	NOS.	Dia. Opening, Inches	Lgth., Ins.	Each
1800	7/8	6	$1.00	1804	2 3/4	23	$2.50
1801 1/2	1 1/2	15	1.50	1805	2 3/4	29	2.50
1802	2 3/16	18	2.50	1806	2 3/4	35	4.00
1803	2 3/16	22	2.50	1807	3 7/16	50	6.00
1803 1/2	2 3/16	29	2.50	1809	4 1/4	53	7.00

STOCKS FOR ROUND SPLIT DIES

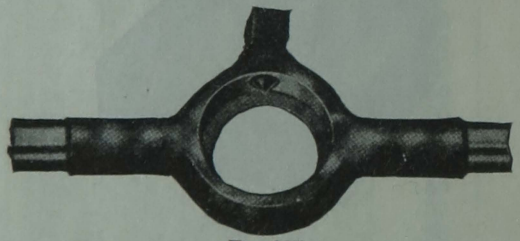

Fig. 137

Made from selected malleable iron castings accurately machined and highly polished, the center being given a durable and pleasant finish. The handles, cast solid with the center in the small sizes, are made of hollow steel tubing in the large stocks. This construction makes the large stock as light and well balanced as some of the smaller solid stocks. The handles are knurled.

A small pressure on the set screw secures the die solidly.

NOS.	Diameter of Dies, Inches	Length, Inches	Weight Each, Pounds	Each
1850	5/8	5	1/16	$0.50
1851	13/16	6 1/4	1/8	.60
1852	1	9	5/16	1.00
1397	1 5/16	14	1	1.25
1854	1 7/16	14	1 1/4	1.50
1853	1 1/2	14	1 1/4	1.50
1855	1 9/16	16	1 1/4	1.50
1856	1 3/4	18	1 1/2	1.75
1857	2	18	1 7/8	2.00
1398	2 1/4	26	2	2.25

DIE HOLDERS

Fig. 138

BIT BRACE AND ROUND SHANK

Specify style of shank, and diameter if round shank is desired.

Dia. Die, Inches	For Bit Brace		For Lathe			
	Nos.	Each	Nos.	Dia. Shank, Inches	Total Length, Inches	Each
5/8	278	$0.60	279	1/2	2 3/4	$0.60
13/16	1861	.75	1871	1/2, 9/16, 11/16	3	.75
1	1862	1.00	1872	1/2, 9/16, 11/16	3 3/8	1.00
1 9/16	1863	1.25	1873	3/4, 13/16, 1	5 1/2	1.25

ACORN DIE ADAPTERS

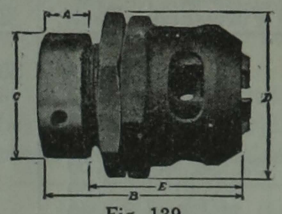

Fig. 139

The Die Adapter is an appliance by means of which Acorn dies may be used in machines or holders already in operation. It is a simple tool made up of three parts; a cap to hold and adjust the die, a lock-nut to secure the adjustment and a threaded body, one end of which fits any round or spring die holder of corresponding size. The body and shank are hollow to permit the cutting of any length of thread, provided the holder or machine will permit.

The Adapter is not designed to take the place of either the regular or the releasing holder, but furnishes means of using Acorn dies with button, spring or floating die holders.

NOS.	Die No.	Dimensions					Each
		C	A	D	E	B	
780	0	5/8	1/4	7/8	25/32	1 1/32	$2.50
781	1	5/8	1/4	1 5/32	31/32	1 7/32	3.00
		13/16	9/32	1 5/32	31/32	1 1/4	
		1"	3/8	1 5/32	31/32	1 11/32	
		13/16	9/32	1 3/4	1 19/32	1 7/8	
		1"	3/8	1 3/4	1 19/32	1 31/32	
782	2	1 1/4	1/2	1 3/4	1 9/16	2 1/16	3.50
		1 1/2	1/2	1 3/4	1 9/16	2 1/16	
		1 5/8	9/16	1 3/4	1 9/16	2 1/8	
783	3	1 1/4	1/2	2 5/32	2 1/32	2 17/32	7.50
		1 1/2	1/2	2 5/32	2 1/32	2 17/32	
		1 5/8	9/16	2 5/32	2 1/32	2 19/32	
		2	5/8	2 5/32	2 1/32	2 21/32	
784	4	2	5/8	2 7/8	2 11/16	3 5/16	10.00

BUSHINGS

These bushings are for adapting Round Adjustable "Button" Dies to holders of larger diameters.

Bushings, Outside Diam., Inches	For Dies, Outside Diam., Inches	Each	Bushings, Outside Diam., Inches	For Dies, Outside Diam., Inches	Each
1	5/8	$0.50	2 1/4	1	$2.00
1	13/16	.50	2 1/2	1	2.00
1 5/16	13/16	1.00	2 1/4	1 5/16	2.00
1 1/2	1	1.00	2 1/2	1 5/16	2.00
2	1	1.00	3	2	2.00

ACORN DIES

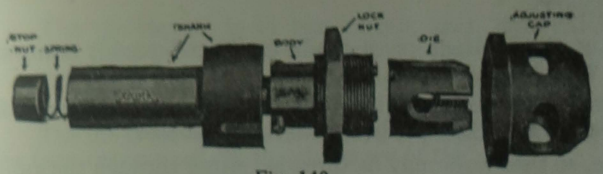

Fig. 140

Adapted to all kinds of machines lathes, drill presses, hand or automatic screw machines, turret lathes, bolt cutters, etc.

The adjusting cap is beveled on the inside to fit the corresponding bevel on the prongs of the die. By turning this threaded cap the correct adjustment is instantly obtained, all the prongs converging equally toward the center. The cap is held in position by the lock nut immediately back of it. The die is held in perfect alignment with the shank. The dies are uniform in length. Once a machine is set, a die may be removed for sharpening, a new die set in its place and the machine is ready at once for threading to exactly the same length. The easiest and simplest to sharpen of any of the spring types of dies.

Nos.	Capacity			Diam. Blank, Inches	Length, Inches	Each
	Mch. Screw	Fract'l Sizes	Pipe, Inches			
0	0–4	1/16–7/64	.....	3/8	3/8	$1.50
1	4–12	1/8–15/64	.....	5/8	1/2	1.75
2	14–28	1/4–7/16	–1/8	7/8	7/8	2.00
3	30	7/16–11/16	1/4–3/8	1 1/4	1 1/4	2.25
4	.....	1 1/16–1	1/2–3/4	1 3/4	1 3/4	2.75

United States Standard threads furnished unless otherwise ordered.

ACORN DIE HOLDERS

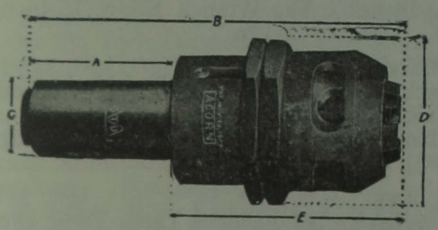

Fig. 141

REGULAR

Of smaller diameter than any other die holder of equal cutting size. Longitudinal float permits the die to follow its own lead independent of any lag in the travel of the machine.

May be used effectively on practically all machines which provide for automatically reversing the die or rod at the instant when the desired length of thread has been cut.

All parts of steel, hardened. The beveled surfaces of both cap and die are ground to gauges, insuring a high degree of accuracy in adjustment.

Five sizes of the blank permit the cutting of all diameters from 1/16 inch to 1 inch.

Holder Nos.	Die Nos.	Body		Shank		Length Thread, Will Cut, Inches	Holder Only, Each
		E	D	A	C		
700	0	1 11/32	7/8	1 1/8	5/8	7/8	$3.00
				2	3/4		
701	1	1 1/2	1 5/32	1 1/8	5/8	1 1/16	4.00
				2	3/4		
702	2	2 3/16	1 3/4	2	7/8	1 7/8	5.00
				3	1		
703	3	3 1/16	2 5/32	3	1	2 3/8	10.00
				3	1 1/4		
704	4	4 1/16	2 7/8	3 1/4	1 1/4	3 3/8	15.00
				3 1/4	1 1/2		

ACORN DIE HOLDERS

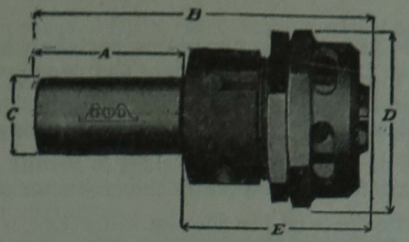

Fig. 142

FOR AUTOMATIC SCREW MACHINES

Short length die holder, similar in many respects to the regular die holder. The number of parts and the manner in which the die is held and adjusted being identical. In order to provide a means for using the die on automatic screw machines which have a limited space around the turret it was necessary to supply a holder shorter than the ordinary. Made with a floating shank which permits the die to follow its own lead.

Holder Nos.	Die Nos.	Body		Shank		Length Thread, Will Cut, Inches	Holder Only, Each
		E	D	A	C		
740	0	1 1/8	1 1/64	1 1/2	5/8	13/16	$3.00
741	1	1 1/4	1 7/16	1 1/4	5/8	1	4.00
				1 1/2	3/4		
742	2	1 13/16	1 47/64	1 1/4	5/8	1 3/8	5.00
				1 3/4	3/4		
743	3	2 3/8	2 7/16	2 1/4	1	1 7/8	10.00
				2 1/2	1 1/4		
744	4	3 1/8	3 3/16	1 3/4	1	2 1/4	15.00
				2 1/2	1 1/4		
				2 1/2	1 1/2		

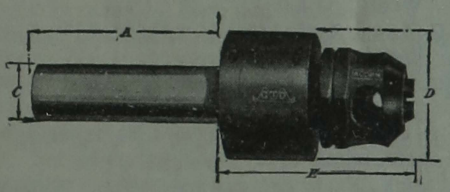

Fig. 143

RELEASING TYPE

The Die with Releasing Holder will thread a given length and then automatically release and revolve with the work, should the latter fail to reverse at the desired moment.

Holder Nos.	Die Nos.	Body		Shank		Length Thread, Will Cut, Inches	Holder Only, Each
		E	D	A	C		
720	0	1 15/16	1 1/4	1 1/4	1/2	No Limit	$9.00
				1 1/4	5/8	No Limit	
721	1	2 3/16	1 5/8	1 1/8	1/2	No Limit	11.00
				1 1/4	5/8	No Limit	
				2	3/4	No Limit	
722	2	2 3/4	2	1 1/4	5/8	No Limit	14.00
				1 1/2	3/4	No Limit	
				2	7/8	No Limit	
				3	1	No Limit	
723	3	3 9/16	2 1/2	1 1/2	3/4	*	18.00
				2 1/4	1	No Limit	
				3	1 1/4	No Limit	
724	4	4 1/2	3 3/16	1 3/4	1	**	24.00
				1 3/4	1 1/4	**	
				3 1/4	1 1/2	No Limit	

*No. 723—3/4 inch shank limited to 2 7/8 inches when cutting 15/32 inch and larger. Unlimited under 15/32 inch.

**No. 724—1 inch shank limited to 3 1/2 inches when cutting 5/8 inch and larger. Unlimited under 5/8 inch. 1 1/4 inch shank limited to 3 1/2 inches when cutting 7/8 inch and larger. Unlimited under 7/8 inch.

SCREW PLATES

LITTLE GIANT

The die proper is in two pieces, each half having two cutting edges. Each piece can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel.

The die is held in a cap. The edges of the die are beveled to the same angle as the beveled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is bevelled on both sides to permit reversing the die, so that work may be threaded either through the guide or from the face, determined by the character of the work.

After the die is laid in the slot in the cap, a screw-guide wedges it tight. The die is thus held in a three-angle grip, the surest grip known to the science of mechanics. It cannot tilt out of alignment.

When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal. Yet it is easily taken apart, the die sharpened, and reassembled.

Each assortment is put up in an oiled hardwood case.

Fig. 144

SINGLE STOCK

Per Set

NO. A1—5 Sizes: $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Wt., 2½ Lbs. $11.50

NO. A1½—7 Sizes: $\frac{1}{16}^{64}$, $\frac{3}{32}^{50}$, $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight, 3 Lbs. 14.50

NO. A2—7 Sizes: $\frac{7}{64}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{64}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight, 3 Lbs. 14.50

NO. A2½—10 Sizes: $\frac{1}{16}^{64}$, $\frac{5}{64}^{60}$, $\frac{3}{32}^{50}$, $\frac{7}{64}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{64}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight, 4 Lbs. 19.50

NO. A3—10 Sizes: $\frac{7}{64}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{64}^{40}$, $\frac{5}{32}^{36}$, $\frac{11}{64}^{32}$, $\frac{3}{16}^{24}$, $\frac{13}{64}^{24}$, $\frac{7}{32}^{24}$, $\frac{15}{64}^{24}$, $\frac{1}{4}^{20}$. Weight, 4 Lbs. 19.50

NO. AA2—5 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}. Weight, 2½ Lbs. 11.50

NO. AA4—7 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}. Weight, 3 Lbs. 14.50

Note.—All above Sets include Plug Taps; Little Giant Dies; 1¼-Inch Diameter Collets; (7½-Inch long), and Adjustable Tap Wrench No. 0 (7½-Inches long).

Per Set

NO. 1—5 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$. Set includes Taper Taps; Little Giant Dies; 2-Inch Diameter Collets; Stock 14½ Inches long; Adjustable Tap Wrench No. 5 (11½ Inches long) and Bit Brace Shank. Weight, 9 Lbs. $18.50

NO. 2—5 Sizes: $\frac{1}{4}^{20}$, $\frac{3}{8}^{16}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Little Giant Dies; 2¾-Inch Diameter Collets; Stock 23 Inches long, and Adjustable Tap Wrench No. 6 (15 Inches long) Weight, 17 Lbs. 22.75

NO. 3—4 Sizes; $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Little Giant Dies; 2¾-inch Diameter Collets; Stock 26 Inches long, and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight 18 Lbs. 26.25

NO. 4—5 Sizes: $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Little Giant Dies; 2¾-Inch Diameter Collets; Stock 26 Inches long, and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 20½ lbs. 29.25

Fig. 145

SINGLE STOCK

Per Set

NO. 5—7 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Dies; 2¾-Inch Diameter Collets; Stock 23 Inches long, and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 20 Lbs. $27.00

NO. 5½—8 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Dies; 2¾-Inch Diameter Collets; Stock 23 Inches long, and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 22 Lbs. 30.75

NO. 6—7 Sizes: $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies, 2¾-Inch Diameter Collets; Stock 26 Inches long, and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 23 Lbs. 35.00

NO. 7—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; 2¾-Inch Diameter Collets; Stock 26 Inches long, and 2 Adjustable Tap Wrenches, No. 5 (11½ Inches long) and No. 7 (9½ Inches long). Weight, 27 Lbs. 42.00

NO. 7½—10 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; 2¾-Inch Diameter Collets; Stock 26 Inches long, and 2 Adjustable Tap Wrenches, No. 5 (11½ Inches long) and No. 7 (19½ Inches long). Weight, 29 Lbs. 44.25

NO. 20—6 Sizes: $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$. Taper Taps; Dies; 4-Inch Diameter Collets; Stock 40 Inches long, and Adjustable Tap Wrench No. 7½ (31 Inches long). Weight, 49½ Lbs. 53.50

NO. 25—6 Sizes: $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Set includes Taper Taps; Dies; 4½-Inch Diameter Collets; Stock 52 Inches long, and Adjustable Tap Wrench No. 8 (40½ Inches long). Weight, 71 Lbs. 70.00

NO. 30—4 Sizes: $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Set includes Taper Taps; Dies; 4½-Inch Diameter Collets; Stock 52 Inches long, and Adjustable Tap Wrench No. 8 (40½ Inches long). Weight, 58 Lbs. 59.00

United States Standard threads furnished unless otherwise ordered.

S.A.E. and Whitworth Standard threads furnished at regular prices if specified.

SCREW PLATES

LITTLE GIANT

The die proper is in two pieces, each half having two cutting edges. Each piece can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel.

The die is held in a cap and edges of die parts are beveled to the same angle as the beveled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is beveled on both sides to permit reversing so that work may be threaded either through the guide or from the face, determined by the character of the work.

After the die is laid in the slot in the cap, a screw-guide wedges it tight. The die is thus held in a three-angle grip, the surest grip known to the science of mechanics. It cannot tilt out of alignment.

When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal. Yet it is easily taken apart, the die sharpened, and reassembled. Each Assortment is put up in an oiled hardwood case.

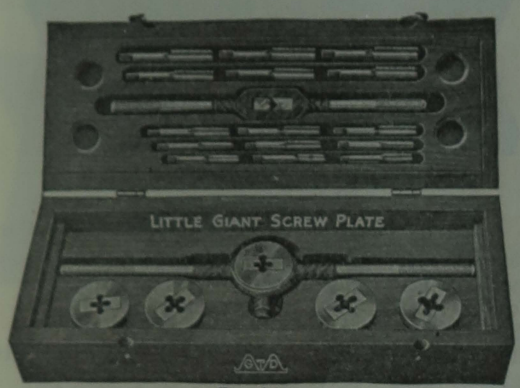

Fig. 146

SINGLE STOCK

With Sets of Taper, Plug and Bottoming Hand Taps

Per Set

NO. 101—5 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$. Set Includes 2 Inch Diameter Collets; Stock 14½ Inches long and Adjustable Tap Wrench No. 5 (11½ Inches long). Weight, 9¾ Lbs. $22.00

NO. 102—5 Sizes: $\frac{1}{4}^{20}$, $\frac{3}{8}^{16}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set Includes 2¾ Inch Diameter Collets; Stock 23 Inches long and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 20 Lbs. 29.50

NO. 103—4 Sizes: $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set Includes 2¾ Inches Diameter Collets; Stock 26 Inches long and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 23½ Lbs. 35.50

NO. 104—5 Sizes: $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes 2¾ Inch Diameter Collets; Stock 26 Inches long and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 26 Lbs. 39.50

NO. 105—7 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes 2¾ Inch Diameter Collets; Stock 23 Inches long and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 23 Lbs. 35.75

NO. 105½—8 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes 2¾ Inches Diameter Collets; Stock 23 Inches long and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 25 Lbs. 39.75

NO. 107—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes 2¾ Inch Diameter Collets; Stock 26 Inches long and Adjustable Tap Wrenches No. 5 (11½ Inches long) and No. 7 (19½ Inches long). Weight, 34 Lbs. 50.50

NO. 107½—10 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Otherwise same as No. 107 ..... 54.50

NO. 130—4 Sizes: $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Set includes 4½ Inch Diameter Collets; Stock 52 Inches long and Adjustable Tap Wrench No. 8 (40½ Inches long). Weight, 81 Lbs. 78.00

Each of the assortments listed above contains Dies and sets of Taper, Plug and Bottoming Hand Taps, in addition to the Stocks, Collets and Tap Wrenches specified.

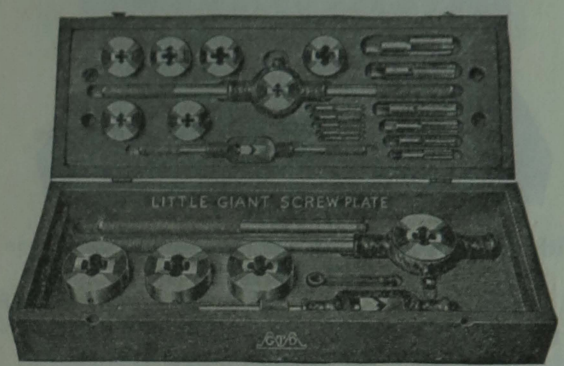

Fig. 147

TWO STOCK

Per Set

NO. A10—7 Sizes: $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$. Set includes 1¼ Inch Diameter Collets for sizes ¼ Inch and smaller, 1⅝ Inch Diameter Collets for sizes $\frac{5}{16}$ Inch and larger; 2 Stocks 7½ Inches and 13½ Inches long and Adjustable Tap Wrench No. 4 (9 Inches long). Weight, 5½ Lbs. $18.25

NO. 8—7 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taps, Dies and Collets as listed above; 2 Stocks 14½ Inches and 26 Inches long; Adjustable Tap Wrench No. 6 (15 Inches long), and Bit Brace Shank fitting 2 Inch Diameter Collets. Weight, 19½ Lbs. 30.00

NO. 9—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taps, Dies and Collets listed above; 2 Stocks 14½ Inches and 29 Inches long; 2 Adjustable Tap Wrenches, No. 5 (11½ Inches long) and No. 7 (19½ Inches long), B.B. Shank for 2 Inch Diameter Collets. Weight, 26 Lbs. 43.50

Note.—Nos. 8 and 9 have Taper Taps; Dies; 2 Inch Diameter Collets for sizes $\frac{7}{16}$ Inch and smaller and 2¾ Inch Diameter for sizes ½ Inch and larger.

Per Set

NO. 40—11 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$. Set includes Taper Taps; 2¾ Inch Diameter Collets for sizes ¾ Inch and smaller, and 4 Inch Diameter for sizes ⅞ Inch and larger; 2 Stocks, 23 Inches and 40 Inches long; 2 Adjustable Tap Wrenches No. 6 (15 Inches long) and No. 7½ (31 Inches long). Weight, 57½ Lbs. 68.50

NO.50—13 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Set includes Taper Taps; Dies; 2¾ Inch Diameter Collets for sizes 1 Inch and smaller and 4½ Inch Diameter for sizes 1⅛ Inch and larger; 2 Stocks, 26 Inches and 52 Inches long; 2 Adjustable Tap Wrenches No. 6 (15 Inches long) and No. 8 (40½ Inches long). Weight, 84 Lbs. .. 92.00

United States Standard threads furnished unless otherwise ordered. S.A.E. and Whitworth Standard threads furnished at regular prices if specified.

SCREW PLATES

LITTLE GIANT

The die proper is in two pieces, each half having two cutting edges and can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel. The die is held in a cap. The edges of the die are beveled to the same angle as the beveled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is beveled on both sides to permit reversing so that work may be threaded either through the guide or from the face, determined by the character of the work. After the die is laid in the slot in the cap, a screw-guide wedges it tight. The die is thus held in a three-angle grip, the surest grip known to the science of mechanics. It cannot tilt out of alignment. When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal, yet it is easily taken apart, the die sharpened, and reassembled. Each assortment is put up in an oiled hardwood case.

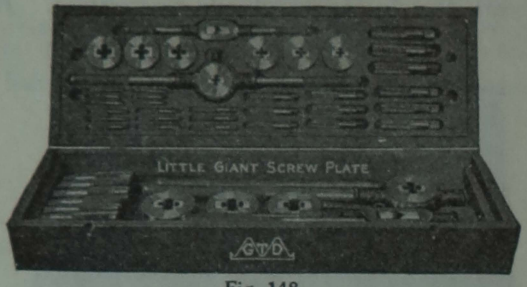

Fig. 148

With Sets of Taper, Plug and Bottoming Hand Taps

TWO STOCK

Per Set

NO. 109—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes 2 Inch Diameter Collets for sizes $\frac{7}{16}$ Inch and smaller and $2\frac{3}{4}$ Inch Diameter for sizes $\frac{1}{2}$ Inch and larger; 2 Stocks, $14\frac{1}{2}$ Inches and 29 Inches long; 2 Adjustable Tap Wrenches, No. 5 ($11\frac{1}{2}$ Inches long) and No. 7 ($19\frac{1}{2}$ Inches long). Weight per set, 32 Lbs. **$56.00**

NO. 140—11 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$. Set includes $2\frac{3}{4}$-Inch Diameter Collets for sizes $\frac{3}{4}$-Inch and smaller and 4-Inch Diameter for sizes $\frac{7}{8}$ Inch and larger; 2 Stocks, 23 Inches and 40 Inches long; 2 Adjustable Tap Wrenches, No. 6 (15 Inches long) and No. $7\frac{1}{2}$ (31 Inches long). Weight per set, 68 Lbs. **89.00**

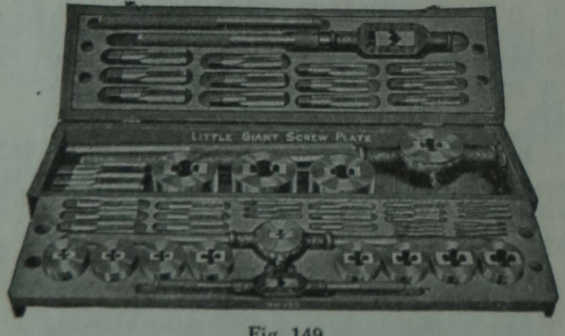

Fig. 149

Per Set

NO. 150—13 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Set Includes $2\frac{3}{4}$-Inch Diameter Collets for sizes 1 Inch and smaller, and $4\frac{1}{2}$-Inch Diameter for $1\frac{1}{8}$ Inch and larger; 2 stocks, 26 Inches and 52 Inches long; 2 Adjustable Tap Wrenches, No. 6 (15 Inches long) and No. 8 ($40\frac{1}{2}$ Inches long). Weight per set, 97 Lbs. **$120.00**

United States Standard threads furnished unless otherwise ordered.

S. A. E. and Whitworth Standard threads furnished at regular prices if specified.

Fig. 150

AUTOMOBILE

With S. A. E. Standard Threads Per Set

NO. 305—5 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$. Set Includes Plug Taps; Dies; 2 Inch Diameter Collets; Stock $14\frac{1}{2}$ Inches long, Bit Brace Shank and Adjustable Tap Wrench No. 5 ($11\frac{1}{2}$ Inches long). Weight per set, 8 Lbs. **$18.50**

NO. 306—6 Sizes: $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$, $\frac{11}{16}^{16}$, $\frac{3}{4}^{16}$, $\frac{7}{8}^{14}$, 1^{14}. Set includes Plug Taps; Dies; $2\frac{3}{4}$ Inch Diameter Collets; Stock 26 Inches long and Adjustable Tap Wrench No. 7 ($19\frac{1}{2}$ Inches long.) Weight per set, $21\frac{1}{2}$ Lbs. **32.75**

NO. 307—11 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$, $\frac{11}{16}^{16}$, $\frac{3}{4}^{16}$, $\frac{7}{8}^{14}$, 1^{14}. Set Includes Plug Taps; Dies; $2\frac{3}{4}$-Inch Diameter Collets; Stock 26 Inches long; 2 Adjustable Tap Wrenches, No. 5 ($11\frac{1}{2}$ Inches long) and No. 7 ($19\frac{1}{2}$ Inches long). Weight per set, 30 Lbs. .. **48.25**

NO. 309—7 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{5}{8}^{18}$, $\frac{3}{4}^{16}$. Set Includes Plug Taps; Dies; $2\frac{3}{4}$-Inch Diameter Collets; Stock 23 Inches long and Adjustable Tap Wrench No. 6 (15 Inches long). Weight per set, 20 lbs. **27.50**

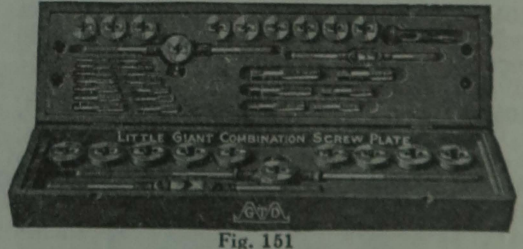

Fig. 151

COMBINATION

Both U. S. Standard and S. A. E. Standard Threads

Combination assortments avoid the expense of buying a separate outfit for each thread standard.

A bit brace shank is provided for convenience where it is desired to run over a slightly battered thread without removing the bolt or screw from its place in the car.

Per Set

NO. 312—10 Sizes: U. S. Std. $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8} and S. A. E. Std. $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$, $\frac{3}{4}^{16}$, $\frac{7}{8}^{14}$, 1^{14}. U. S. Standard, Taper Taps—S. A. E., Plug Taps. Set Includes Dies for each size; 2-Inch Diameter Collets for sizes $\frac{1}{2}$ Inch and smaller; $2\frac{3}{4}$ Inch for larger sizes; Bit Brace Shank fitting 2-Inch Collets; 2 Stocks $14\frac{1}{2}$ Inch and 29 Inch; 2 Adjustable Tap Wrenches No. 5 ($11\frac{1}{2}$ Inches long) and No. 7 ($19\frac{1}{2}$ Inches long). Weight per set, 45 Lbs. **$79.00**

SCREW PLATES

LITTLE GIANT

The die proper is in two pieces, each half having two cutting edges. Each piece can be easily and quickly removed from the cap and the cutting edges sharpened on a thin emery wheel.

The die is held in a cap and the edges are beveled to the same angle as the beveled edges of the slot in the cap. A small screw at each end of the slot enables the workman to adjust the halves to the exact size.

The die is beveled on both sides to permit reversing the die so that work may be threaded either through the guide or from the face, determined by the character of the work.

After the die is laid in the slot in the cap, a screw-guide wedges it tight. It is thus held in a three-angle grip, the surest grip known to the science of mechanics It cannot tilt out of alignment.

When the screw-guide is tightened, the whole (die, cap and screw-guide) becomes practically a solid die, possessing all the rigidity of a solid piece of metal. Yet it is easily taken apart, the die sharpened, and reassembled. Each assortment is put up in an oiled hardwood case.

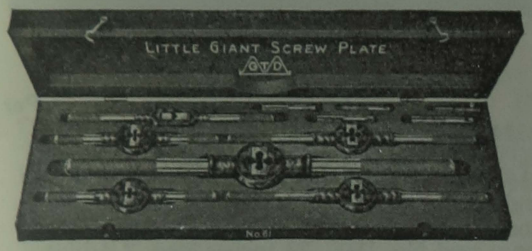

Fig. 152

FULL MOUNTED

Per Set

NO. 61—5 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$. Set includes Taper Taps; Dies; Separate Stock for each Die and Adjustable Tap Wrench No. 5 (11½ Inches long). Weight, 13½ Lbs.. $22.00

NO. 62—5 Sizes: $\frac{1}{4}^{20}$, $\frac{3}{8}^{16}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Dies; Separate Stock for each Die and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 22 Lbs..... 29.00

NO. 63—4 Sizes: $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; Separate Stock for each Die, and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 28 Lbs..... 36.50

NO. 64—5 Sizes: $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; Separate Stock for each Die, and Adjustable Tap Wrench No. 7 (19½ Inches long). Weight, 30 Lbs... 37.50

NO. 65—7 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Dies; Separate Stock for each Die, and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 24 Lbs. 34.50

NO. 65½—8 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Set includes Taper Taps; Dies; Separate Stock for each Die, and Adjustable Tap Wrench No. 6 (15 Inches long). Weight, 28 Lbs..... 38.50

NO. 67—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; Separate Stock for each Die; 2 Adjustable Tap Wrenches, No. 5 (11½ Inches long) and No. 7 (19½ Inches long). Weight, 37½ Lbs... 54.00

NO. 67½—10 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Set includes Taper Taps; Dies; Separate Stock for each Die, 2 Adjustable Tap Wrenches, No. 5 (11½ Inches long) and No. 7 (19½ Inches long.) Weight, 42 Lbs..... 58.25

NO. 640—11 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$. Set includes Taper Taps; Dies; Separate Stock for each Die, 2 Adjustable Tap Wrenches, No. 6 (15 Inches long) and No. 7½ (31 Inches long). Weight, 61 Lbs..... 77.50

United States Standard threads furnished unless otherwise ordered.

S. A. E. and Whitworth Standard threads furnished at regular prices if specified.

REPAIR PARTS

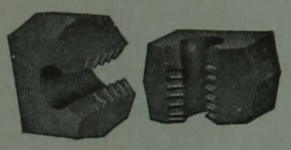

Fig. 153

DIES

M. S. Sizes	4	6	8	10	12	14	16
Each	$0.75	.75	.75	.75	.75	.75	.75
Size, Inches			1/16	5/64	3/32	7/64	1/8
Each			$0.75	.75	.75	.75	.75
Size, Inches			9/64	5/32	11/64	3/16	13/64
Each			$0.75	.75	.75	.75	.75
Size, Inches			7/32	15/64	1/4	5/16	3/8
Each			$0.75	.75	.75	1.00	1.25

For price of larger sizes, see regular list.

TAPS

M. S. Sizes	4	6	8	10	12	14	16
Each	$0.40	.35	.35	.40	.45	.45	.45
Size, Inches			1/16	5/64	3/32	7/64	1/8
Each			$0.50	.45	.40	.40	.35
Size, Inches			9/64	5/32	11/64	3/16	13/64
Each			$0.35	.35	.35	.40	.40
Size, Inches			7/32	15/64	1/4	5/16	3/8
Each			$0.45	.45	.45	.50	.55

For price of larger sizes, see regular list.

COLLETS

NOS.	A1	A10	1
Outside Diameter, Inches	1¼	1⅝	2
Capacity, Inches—M. S.	4–¼	5/16–⅜	¼–½
Caps, Each	$0.25	.30	.30
Guides, Each	$0.15	.20	.20
Complete, Each	$0.40	.50	.50

NOS.	5	20	25
Outside Diameter, Inches	2¾	4	4½
Capacity, Inches	¼–1	⅝–1¼	⅞–1½
Caps, Each	$0.50	1.00	1.50
Guides, Each	$0.20	.50	.50
Complete, Each	$0.70	1.50	2.00

STOCKS

NOS.	A1	A10	1
Diameter Collet, Inches	1¼	1⅝	2
Length, Inches	7½	13½	14½
Each	$1.00	1.25	1.50

NOS.	5	20	25
Diameter Collet, Inches	2¾	4	4½
Length, Inches	23–26–29	40	52
Each	$3.00	6.00	8.00

SCREW PLATES

GREEN RIVER

Round, two-piece die, extremely simple in construction and requiring no collet. Is fastened to a base which forms a guide for the work to be cut. The two halves of the die are hinged together by a cup-head screw, which, with the taper-head adjusting screw, hold the die and guide together. The die may be adjusted to size, without removal from stock or holder, by turning the taper-head screw in, to open, and out, to close. While Dies are intended to cut from the side next the guide, they are also slightly less chamfered on the face side to enable them to cut close to shoulder. Each assortment is put up in an oiled hardwood case.

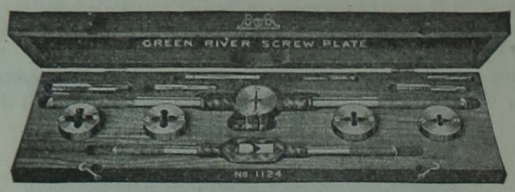

Fig 154

SINGLE STOCK

Machine Screw Sizes — Per Set

NO. 151—5 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}. Weight per Set, 2½ Lbs. **$10.50**

NO. 153—7 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}. Weight per Set, 2½ Lbs. **13.50**

NO. 155—10 Sizes: 2^{56}, 3^{48}, 4^{36}, 5^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}. Weight per Set, 5 Lbs. **18.00**

Fractional Sizes

NO. 150Y—5 Sizes: $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight per Set, 3 Lbs. **10.50**

NO. 152—7 Sizes: $\frac{7}{16}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{64}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight per Set, 3 Lbs. **13.50**

NO. 154—10 Sizes: $\frac{1}{16}^{64}$, $\frac{5}{64}^{60}$, $\frac{3}{32}^{50}$, $\frac{7}{64}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{16}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$. Weight per Set, 3½ Lbs. **18.00**

Note.—Above Sets include Dies and Guides, ⅞ Inch outside diameter; Plug Taps; Stock No. 1800, 6 Inches long, and T style Tap Wrench.

Per Set

NO. 1100—7 Sizes: $\frac{1}{8}^{40}$, $\frac{3}{16}^{24}$, $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$. Dies and Guides 1½ Inches outside diameter; Stock No. 1801½, 15 Inches long; Adjustable Tap Wrench, No. 5, 11 Inches long. Weight per Set, 15 Lbs. **$20.50**

NO. 1104—7 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$. Dies and Guides 2 3/16 Inches outside diameter; Stock, No. 1803, 22 Inches long; Adjustable Tap Wrench, No. 6, 15 Inches long. Weight per Set, 16 Lbs. **27.50**

NO. 1108—5 Sizes: $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Dies and Guides, 2¾ Inches outside diameter; Stock, No. 1805, 29 Inches long; Adjustable Tap Wrench, No. 7, 19½ Inches long. Weight per Set, 25½ Lbs. **29.25**

NO. 1110—7 Sizes: $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Dies and Guides, 2¾ Inches outside diameter; Stock, No. 1805, 29 Inches long; Adjustable Tap Wrench, No. 7, 19½ Inches long. Weight per Set, 29 Lbs. **35.00**

NO. 1112—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Dies and Guides, 2¾ Inches outside diameter; Stock, No. 1805, 29 Inches long; 2 Adjustable Tap Wrenches, No. 5, 11½ Inches long, and No. 7, 19½ Inches long. Weight per Set, 32 Lbs. **42.00**

NO. 1116—6 Sizes: $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$, $1\frac{3}{8}^{6}$, $1\frac{1}{2}^{6}$. Dies and Guides, 3 3/16 Inches outside diameter; Stock, No. 1807, 50 Inches long; Adjustable Tap Wrench, No. 8, 40½ Inches long. Weight per Set, 21 Lbs. **70.00**

Above Sets include Taper Taps

United States Standard threads furnished unless otherwise ordered.

S.A.E. and Whitworth threads at same prices.

Fig. 155

TWO STOCK

Per Set

NO. 1114—9 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}. Taper Taps; Dies and Guides, 1½ Inches outside diameter for sizes 7/16 Inch and smaller, and 2¾ Inches for sizes ½ Inch and larger; 2 Stocks, No. 1801½, 15 Inches long, and No. 1805, 29 Inches long; 2 Adjustable Tap Wrenches, No. 5, 11½ Inches long, and No. 7, 19½ Inches long. Weight per Set, 27 Lbs. **$43.50**

NO. 1119—11 Sizes: $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, $\frac{7}{8}^{9}$, 1^{8}, $1\frac{1}{8}^{7}$, $1\frac{1}{4}^{7}$. Taper Taps; Dies and Guides, 2 3/16 Inches outside diameter for sizes 7/16 Inch and smaller, and 2¾ Inches for sizes ½ Inch and larger; 2 Stocks, No. 1802, 18 Inches long, and No. 1806, 35 Inches long; Adjustable Tap Wrenches, No. 5, 11½ Inches long, and No. 7½, 31 Inches long. Weight per Set, 44 Lbs. **68.50**

AUTOMOBILE

With S. A. E. Standard Threads

NO. 1460—5 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$. Plug Taps; Dies and Guides, 2 3/16 Inches outside diameter; Stock, No. 1802, 18 Inches long; Adjustable Tap Wrench, No. 5, 11½ Inches long. Weight per Set, 11 Lbs. **18.50**

NO. 1464—7 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{5}{8}^{18}$, $\frac{3}{4}^{16}$. Plug Taps; Dies and Guides, 2 3/16 Inches outside diameter; Stock, No. 1803, 22 Inches long; Adjustable Tap Wrench, No. 6, 15 Inches long. Weight per Set, 16 Lbs. **27.50**

NO. 1462—11 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$, $\frac{11}{16}^{16}$, $\frac{3}{4}^{16}$, $\frac{7}{8}^{14}$, 1^{14}. Plug Taps; Dies and Guides, 2 3/16 Inches outside diameter; Stock, No. 1803, 22 Inches long; 2 Adjustable Tap Wrenches, No. 5, 11½ Inches long, and No. 7, 19½ Inches long. Weight per Set, 27 Lbs. .. **48.25**

COMBINATION

Both U. S. Standard and S. A. E. Standard Threads

NO. 1468—5 Sizes: U. S. Standard $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$ and S.A.E. Standard $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$. Stock 18 Inches long; Adjustable Tap Wrench No. 5, 11½ Inches long; Bit Brace Die Holder. Weight per Set, 18 Lbs. **29.25**

NO. 1469—8 Sizes: U. S. Standard $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, $\frac{1}{2}^{13}$, $\frac{9}{16}^{12}$, $\frac{5}{8}^{11}$, $\frac{3}{4}^{10}$, and S.A.E. Standard $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$, $\frac{3}{4}^{16}$. Stock 22 Inches long; Adjustable Tap Wrench, No. 6, 15 Inches long; Bit Brace Die Holder. Weight per Set, 31 Lbs. **56.00**

Note—Above Set includes U. S. Taper Taps; S. A. E. Plug Taps; Dies; 2 3/16 Inch diameter for each cutting size.

SCREW PLATES

"BUTTON" DIE

Round Adjustable Split Die is made from a solid piece of steel, carefully hobbed, split on one side to provide means of adjusting, and spring tempered on the opposite side. Adjustment is accomplished by means of a fine pitch screw in the split side which forces the teeth away from the center, or allows them to spring together. Abundant chip room is provided in the large clearance holes back of the lands. Each assortment is put up in an oiled hardwood case.

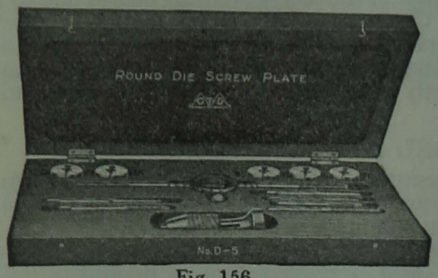

Fig. 156

D Assortments ($13/16$ Inch Diameter Dies)

Machine Screw Sizes — **Per Set**

NO. D5—5 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, weight, $1\frac{3}{4}$ Lbs. $7.00

NO. D6—6 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, weight, $1\frac{3}{4}$ Lbs. 8.25

NO. D7—7 Sizes: 4^{36}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}, weight, $1\frac{3}{4}$ Lbs. 9.25

NO. D10—10 Sizes: 2^{56}, 3^{48}, 4^{36}, 5^{32}, 6^{32}, 8^{32}, 10^{24}, 12^{24}, 14^{20}, 16^{18}, weight, 2 Lbs. 12.50

Fractional Sizes

NO. DD5—5 Sizes: $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, weight, $1\frac{1}{2}$ Lbs. 7.00

NO. DD6—6 Sizes: $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, $\frac{9}{32}^{20}$, weight, $1\frac{3}{4}$ Lbs. 8.25

NO. DD7—7 Sizes: $\frac{7}{64}^{48}$, $\frac{1}{8}^{40}$, $\frac{9}{64}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, weight, $1\frac{3}{4}$ Lbs. 9.25

NO. DD8—8 Sizes: $\frac{1}{16}^{64}$, $\frac{3}{32}^{50}$, $\frac{1}{8}^{40}$, $\frac{5}{32}^{36}$, $\frac{3}{16}^{24}$, $\frac{7}{32}^{24}$, $\frac{1}{4}^{20}$, $\frac{9}{32}^{20}$, weight $1\frac{3}{4}$ Lbs. 10.50

Note.—Above Sets include: Round Adjustable Split Dies; Plug Taps; D Stock, ($6\frac{1}{4}$ Inches long).

Tap Wrench made by inserting adjustable socket in stock.

F Assortments (1 Inch Diameter Dies)

NO. F5—5 Sizes: $\frac{3}{16}^{24}$, $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, weight, $2\frac{1}{2}$ Lbs. 11.00

NO. F6—6 Sizes: $\frac{1}{8}^{40}$, $\frac{3}{16}^{24}$, $\frac{1}{4}^{20}$, $\frac{5}{16}^{18}$, $\frac{3}{8}^{16}$, $\frac{7}{16}^{14}$, weight, $2\frac{3}{4}$ Lbs. 12.25

Note.—Above Sets include: Round Adjustable Split Dies; Plug Taps; F Stock, 9 Inches long; Adjustable Tap Wrench No. 4, 9 Inches long.

U. S. Stand. thread furnished unless otherwise specified.

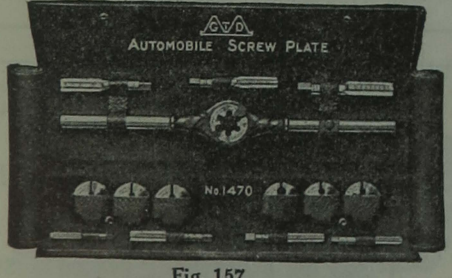

Fig. 157

AUTOMOBILE— In Leather Rolls

S. A. E. Standard Threads — **Per Set**

NO. 1470—7 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$, $\frac{9}{16}^{18}$, $\frac{5}{8}^{18}$. Set includes Plug Taps; Round Adjustable Split Dies, $1\frac{1}{2}$-Inch outside diameter; Stock, No. 1853, 14 Inches long. Weight $3\frac{3}{4}$ Lbs. $16.50

NO. 1471—Same as above with Adjustable Tap Wrench, No. 6, 15 Inches long. Weight $4\frac{1}{2}$ Lbs. 20.50

NO. 1475—5 Sizes: $\frac{1}{4}^{28}$, $\frac{5}{16}^{24}$, $\frac{3}{8}^{24}$, $\frac{7}{16}^{20}$, $\frac{1}{2}^{20}$. Set includes Plug Taps; Round Adjustable Split Dies, 1 Inch outside diameter; Stock, No. 1852, 9 Inches long; "T" Tap Wrench No. 333. Weight 3 Lbs. 11.75

REPAIR PARTS

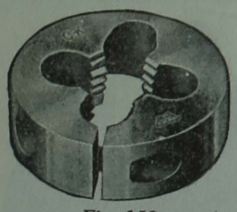

Fig. 158

DIES

Cutting Size	Diameter, Inches		Cutting Size	Diameter, Inches		
	$13/16$, Each	1, Each		$13/16$, Each	1, Each	$1\frac{1}{2}$, Each
Mach. Scr.			Fractional			
2	$0.80		$\frac{7}{64}$	$0.60		
3	.70		$\frac{1}{8}$	.60	$0.75	
4	.60		$\frac{9}{64}$	.60	.75	
5	.60		$\frac{5}{32}$	.60	.75	
6	.60	$0.75	$\frac{3}{16}$	.60	.75	
8	.60	.75	$\frac{7}{32}$	.60	.75	
10	.60	.75	$\frac{1}{4}$	.60	.75	$1.00
12	.60	.75	$\frac{9}{32}$	.60	.75	1.00
14	.60	.75	$\frac{5}{16}$	.60	.75	1.00
16	.60	.75	$\frac{3}{8}$	.....	.75	1.00
18	.60	.75	$\frac{13}{32}$	.....	.75	1.00
Fractional			$\frac{7}{16}$	.....	.75	1.00
$\frac{1}{16}$	.90		$\frac{1}{2}$	.....	.....	1.00
$\frac{5}{64}$	.80		$\frac{9}{16}$	.....	.....	1.00
$\frac{3}{32}$	.70		$\frac{5}{8}$	.....	.....	1.00

TAPS

M. S. Size	2	3–4	5–8	10	12–16	18
Each	$0.45	.40	.35	.40	.45	.50
Size, Inches	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{32}$–$\frac{7}{64}$		$\frac{1}{8}$–$\frac{5}{32}$	$\frac{3}{16}$
Each	$0.50	.45	.40		.35	.40
Size, Inches	$\frac{7}{32}$–$\frac{9}{32}$		$\frac{5}{16}$	$\frac{3}{8}$		$\frac{13}{32}$
Each	$0.45		.50	.55		.55
Size, Inches	$\frac{7}{16}$		$\frac{1}{2}$	$\frac{9}{16}$		$\frac{5}{8}$
Each	$0.60		.70	.80		.90

STOCKS

NOS.	Diameter of Die, Inches	Length, Inches	Each
1851	$\frac{13}{16}$	$6\frac{1}{4}$	$0.60
1852	1	9	1.00
1853	$1\frac{1}{2}$	14	1.50

TAP WRENCHES

NOS.	Style	Capacity, Inches	Length, Inches	Each
329	T Handle	$\frac{1}{16}$ to $\frac{9}{32}$	$2\frac{1}{2}$	$0.50
333	T Handle	$\frac{5}{16}$ to $\frac{1}{2}$	$3\frac{5}{8}$	1.00
340	Stock Chuck	$\frac{1}{16}$ to $\frac{9}{32}$	$2\frac{5}{8}$	.50
4	Regular	$\frac{1}{16}$ to $\frac{3}{8}$	9	1.75
5	Regular	$\frac{3}{16}$ to $\frac{1}{2}$	11	2.00
6	Regular	$\frac{1}{4}$ to $\frac{3}{4}$	15	2.50

SELF-OPENING DIES

WELLS

Permit more rapid and economical production of small threaded parts (for manufacturers) and with higher standards of accuracy than when solid dies are used.

Chasers readily removed or replaced, permitting them to be sharpened easily and quickly. Removal of chasers does not disturb setting or adjustment of die head. Chips fall in front of, not in the die, preventing delays due to clogging. No obstruction in front of hands, enabling thread to cut to shoulder. Chasers may be re-ground many times.

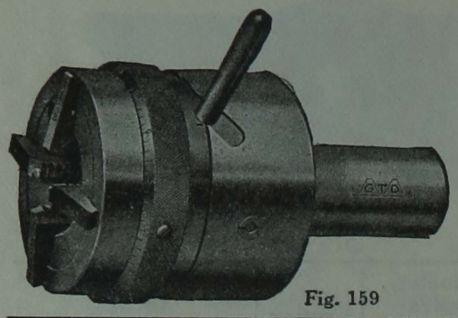

Fig. 159

These chasers are of ample proportions and are formed so that they fit snugly within their slots in the die head. This positive support holds them rigid, and their generous depth and length prevent chattering and the development of any side twist.

MODEL B—PULL TRIP

Model B is especially designed for use on Brown & Sharpe Automatic Screw Machines, but is equally successful on practically all styles of machines on which threading can be done.

This model is equipped with a pull trip to avoid the need of rigging stops on the machine. The pull trip permits a certain amount of float in the die head. The closing lever operates with a helical motion.

Stocked in solid shank. Hollow shank substituted without extra charge. Hollow shank will permit any length of thread.

NOS.	880	881	882	883	884	885
Capacity, Bolt Threads, Inches	0 to 1/4	1/8 to 1/4	1/4 to 3/4	3/8 to 1	5/8 to 1 1/2	3/4 to 2
Capacity, Pipe Threads, Inches	.....	1/8	1/8 to 3/8	1/4 to 3/4	3/8 to 1 1/4	1/2 to 1 1/2
Diameter of Head, Inches	2	2 5/16	3 1/8	3 3/4	5 1/4	6
Length of Head, Inches	1 15/16	2 5/16	3 13/16	3 3/8	4 3/8	5 1/4
Diameter of Shank, Inches	5/8, 1/16 1, 3/4, 1	3/4, 7/8, 1	1, 1 1/4	1 1/4, 1 1/2	2 1/2	3
Length of Shank, Inches	1 3/8, 2	1 1/2, 2 1/2	3	3	4 5/8	5 1/4
Length Over All, Inches	3 15/16	4 13/16	6 3/16	6 3/8	9 1/16	10 1/2
Center Head to Tip, Inches	2 3/8	2 5/8	3 1/2	3 13/16	5 11/16	6 5/16
Length Thread, Solid Shank, Inches	1 1/2	1 1/2	2 1/2	2 3/4	4	5 3/4
With 1 Set Alloy Steel Chasers, Each	$30.00	$40.00	$50.00	$60.00	$80.00	$100.00
With Assortment of Chasers and Blocks, Each	6 Sets $38.75 12 Sets $49.25	6 Sets $50.00 12 Sets $62.00	9 Sets $70.00	9 Sets $84.00	.....	.....
Extra Chasers, Per Set	$1.75	$2.00	$2.50	$3.00	$4.00	$6.00

MODEL T—RIM TRIP

Model T is designed for all machines where the die revolves, such as drill presses, multiple spindle screw machines, bolt cutters, etc.

This model is closed by having a "yoke" push the outer shell forward, after the die backs off the work, or by a stop bearing on one side only.

Stocked in solid shank. Hollow shank substituted without extra charge. Hollow shank will permit the cutting of any length of thread.

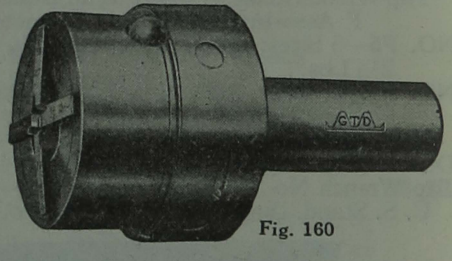

Fig. 160

NOS.	840	841	842	843
Capacity, Bolt Threads, Inches	0 to 1/4	1/8 to 1/2	1/4 to 3/4	3/8 to 1
Capacity, Pipe Threads, Inches		1/8	1/8 to 3/8	1/4 to 3/4
Diameter of Head, Inches	2 1/4	2 1/2	3 1/8	3 7/8
Length of Head, Inches	1 11/16	2 1/16	2 13/16	2 15/16
Diameter of Shank, Inches	5/8, 11/16, 3/4	3/4, 7/8, 1	1, 1 1/4	1 1/4, 1 1/2
Length of Shank, Inches	2	2 1/2	3	3 1/4
Length Over All, Inches	3 5/8	4 1/2	5 3/4	6 1/4
Length Thread, Solid Shank, Inches	1 1/2	1 1/2	2 1/2	2 1/2
With 1 Set Alloy Steel Chasers, Each	$25.00	$35.00	$45.00	$55.00
With Assortment of Chasers and Blocks, Each	6 Sets $33.75 12 Sets $44.25	6 Sets $45.00 12 Sets $57.00	9 Sets $65.00	9 Sets $79.00
Extra Chasers, Per Set	$1.75	$2.00	$2.50	$3.00

When ordering chasers, specify thread diameter, pitch and form, also material upon which it is to be used; for instance, 1 Inch-8 U. S. S. for threading rolled brass.

Hollow mill chasers can be furnished at above prices.

Stocked in solid shank. Special shanks furnished at a 5 per cent. increase in price.

United States Standard threads furnished unless otherwise ordered.

Pipe Sizes: Briggs standard right-hand threads furnished unless otherwise specified. Whitworth threads (right-hand) furnished at regular prices. Left-hand threads are special.

Fine Pitch for Brass: American standard (all 27 straight threads) right-hand dies furnished unless otherwise specified. British standard (26 threads) furnished at regular prices. Cutting sizes, 1/4 Inch, 5/16 Inch, 3/8 Inch, 7/16 Inch, 1/2 Inch, 9/16 Inch, 5/8 Inch, 3/4 Inch, 7/8 Inch, 1 Inch.

SELF OPENING DIE HEADS

H. & G.

These die heads are made of the best material and are of fine workmanship. All parts are hardened and ground and are interchangeable. The Chasers are held firmly over the cutting edge and cannot tip. Quick release insures cutting the thread to a given point and close to shoulder. Cams are inclosed so that chips cannot clog the working of the head or cause the size of threads to change. Opening of die is positive, being operated by a cam and not by spring pressure. Die is easily adjusted to suit work by loosening a screw and moving a dial, graduated in thousandths of an inch. Cannot change when locked. Chasers are easily removed without taking head apart.

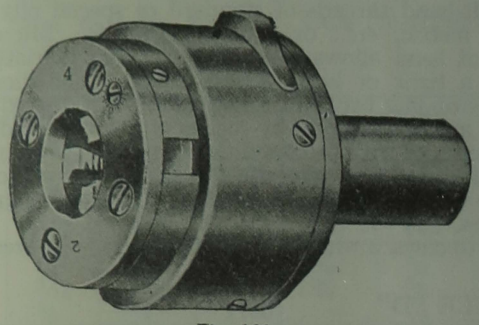

Fig. 161

STYLE A—ROTATING

Designed for Gridley and National Acme Multiple Spindle screw machines and other machines that use a revolving die.

With Opening and Closing Yokes for Gridley Screw Machines

Capacity, Inches	9/16	1	1¼	1½	2
Head Swings, Inches	3	3 15/16	4 5/8	5 1/8	5¾
Weight, Each, Lbs.	3¾	5½	9½	12¾	18½
Each	$50.00	60.00	80.00	110.00	160.00

Without Opening and Closing Yokes

Capacity, Inches	9/16	1	1¼
Head Swings, Inches	3	3 15/16	4 5/8
Weight, Each, Lbs.	2¾	5½	9½
Each	$40.00	50.00	70.00

Capacity, Inches	1½	2	3
Head Swings, Inches	5 1/8	5¾	..
Weight, Each, Lbs.	12¾	18½	..
Each	$100.00	150.00	250.00

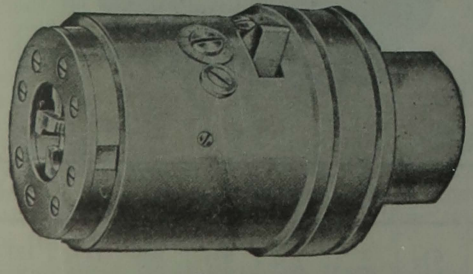

Fig. 162

STYLE B—FORD SPECIAL ROTATING

Designed for threading machines. The head works in a revolving position and has large adjustment. Parts are all made of tool steel, hardened and ground and have wide wearing surfaces. The regular Chasers for the 1-inch head are used in this head and are made of high speed steel.

To cut up to, Inches	1	1½
Head Swings, Inches	4½	5¾
Weight, Each, Lbs.	10¼	23½
Each	$75.00	125.00

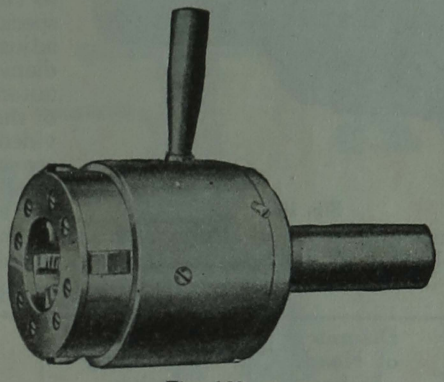

Fig. 163

STYLE C—HAND CLOSING

Designed for use on all turret machines. Has a hollow shank so that any length of thread can be cut. Can be furnished in any diameter shank desired. The outside surface is smooth. When ordering state size of shank wanted.

Capacity, Inches	9/16	1	1½	2	3
Weight, Each, Lbs.	4¾	10½	23¾	..	..
Each	$50.00	60.00	100.00	150.00	250.00

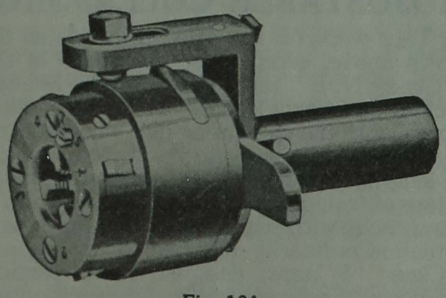

Fig. 164

STYLE D

Designed especially for Brown and Sharpe Automatic Screw Machines. Lock is positive so that the jarring of the turret will not unlock the head. Head is closed with a rotary cam which closes very easily by revolving the turret of the machine. The trip is positive and instantaneous, thus allowing the thread to be cut to a shoulder or given point every time. The chasers are held firmly, insuring straight threads. Floating head and compensating spring for starting thread. Specially hardened high speed cutters.

Capacity, Inches	¼	⅜	9/16
Head Swings, Inches	1 7/16	1 15/16	2 9/16
Weight, Each, Lbs.	¾	2½	5
Each	$30.00	..	60.00

SCREW CUTTING DIE HEADS

GEOMETRIC—SELF-OPENING AND ADJUSTABLE

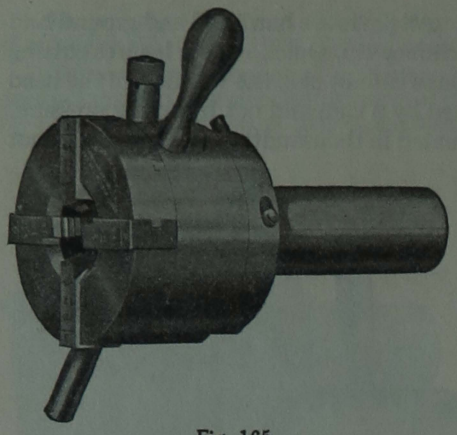

Fig. 165

Insure, in the manufacture of small parts, more rapid and economical production with higher standards of accuracy of threaded parts than when solid dies are used in either turret or automatic screw machines.

Style "D" model is used on the turret of hand and automatic screw machines in place of solid dies. The chasers are held on splines of liberal size at one side of the openings, in which they fit closely, effectively preventing any lateral or vertical movement. Their position, with relation to the diameter of the thread to be cut, is controlled by similar splines in the shape of cams engaging the slots on the lower faces of the dies. Can be used to cut either right- or left-hand threads of standard or special pitch, and special forms, as acme, metric, etc., or standard threads. Micrometer adjustment at one side of head allows quick and accurate variations in diameter of threads for a tight or loose fitting thread. The dies open automatically by simply stopping travel of turret slide when desired length of thread is reached, and are closed again by means of a small handle provided at one side of the head, or may be closed automatically, if desired, by screwing a pin into the threaded hole opposite the handle and attaching a small piece of flat steel to the back of the turret slide, which will engage the pin as the turret revolves.

By using extra sets of chasers each size of Die-head can be fitted to cover a wide range of diameters. In every case the Die-head must be held and the work revolved.

SPECIFICATIONS—STYLE "D"

Size, Inches	Diameter of Head, Inches	Diameter of Shank, Inches	Length of Shank, Inches	Length of Head, Inches	Length Over All, Inches	Capacity, Inches
5/16	1 3/4	*5/8 or 3/4	1 3/4	1 3/8	3 1/8	3/32 to 5/16
9/16	2 7/16	7/8 or 1	2 1/2	2 1/16	4 9/16	1/8 to 9/16
3/4	2 15/16	1 1/4 or 1 1/2	3	2 13/16	5 13/16	1/4 to 3/4
1	3 9/16	1 1/2 or 1 3/4	3 1/2	3 1/4	6 3/4	3/8 to 1
1 1/4	4 15/16	1 3/4 or 2	4 1/4	4	8 1/4	1/2 to 1 1/4
1 1/2	5 5/16	2 1/4 or 2 3/4	4 3/4	4 3/4	9 1/2	5/8 to 1 1/2
2	6 3/8	3 or 3 1/2	5 1/4	5 1/4	10 1/2	3/4 to 2
2 1/2	6 7/8	3 1/2 or 4	5 7/8	5 3/8	11 1/4	1 to 2 1/2
3	7 1/2	4 or 4 5/8	6 1/2	6 1/8	12 5/8	1 1/2 to 3
3 1/2	8 1/2	4 1/2 or 5 1/2	7	7	14	2 to 3 1/2
4 1/2	11	6 or 7 1/2	10	8 1/8	18 1/8	2 1/2 to 4 1/2

Prices on application. *Shanks of special diameter can be furnished when required.

Note.—Illustration shows Die-head without protective face plate, which is furnished on all sizes of Die-heads one-inch sizes and over.

ADJUSTABLE COLLAPSING TAPS

These Taps work on the same principle as the self-opening Die-heads shown above, except that the action of the mechanism is reversed. Class "N. L." taps are for use on live spindles, and also on screw machine and turret lathes. They are fitted with different forms of trips to collapse the chasers or dies when end of thread is reached, in accordance with the work to be tapped. Adjustable as to diameter and length of threads. Chasers recede automatically when contact plate of tripping mechanism strikes work. Roughing or finishing attachment with which second or finishing cut can be made in less time than is ordinarily required to reverse machine can be supplied. Class "P" taps, designed more particularly for use on turrets of screw machines, can be furnished on order.

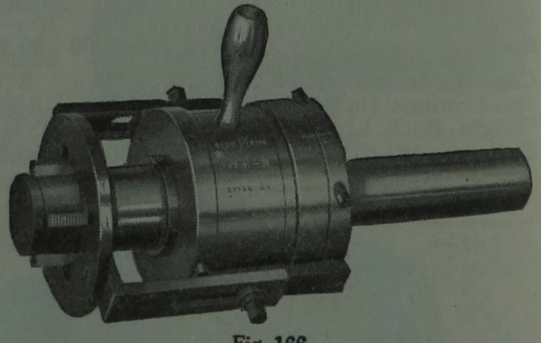

Fig. 166

SPECIFICATIONS—"N. L"

Size, Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8	9	10
Largest Diameter of Tap, Inches	2 5/16	3 1/4	3 1/4	3 13/16	3 13/16	4 7/8	5 1/4	5 5/8	6 1/2	7	7 1/2	8 1/2	9 1/2	11 1/4	12 1/2	13 1/2
Length of Tap, Ins.	4 5/16	5 5/8	5 3/4	6 1/4	6 3/8	7	7 1/8	7 1/8	8 5/16	8 5/16	9 5/16	9 5/16	9 5/16	9 11/16	9 11/16	9 11/16
Diameter of Shank, Inches	5/8 to 7/8	1 to 1 3/8	1 to 1 3/8	1 1/8 to 1 5/8	1 1/8 to 1 5/8	1 1/8 to 2 3/8	1 5/8 to 2 3/8	1 5/8 to 2 3/8	1 5/8 to 3 1/8	1 5/8 to 3 1/8	1 3/4 to 3 7/8	1 3/4 to 3 7/8	1 3/4 to 3 7/8	2 1/2 to 4 1/2	2 1/2 to 4 1/2	2 1/2 to 4 1/2
Min. length of Shank, Inches	2	2 3/4	2 3/4	3	3	3	3	3	3	3	3	3	3	4	4	4
Taper Shank, Nos.	2	3 or 4	3 or 4	4	4	4 or 5	5	5	5 or 6	5 or 6	5 or 6	5 or 6	5 or 5	6	6	6
Length Over All, Inches	6 3/16	10 3/8	10 1/2	11	11 1/8	11 3/4	12 1/8	12 1/8	13 5/16	13 5/16	14 13/16	14 13/16	14 13/16	15 11/16	15 11/16	15 11/16
Capacity, Pipe Sizes, Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2 & 4	4 & 4 1/2	4 1/2 & 5	5 & 6	6 & 7	7 & 8	8 & 9	9 & 10	10 to 12
Capacity, Straight Thread, Inches	1 1/16 to 1 3/16	1 3/8 to 1 1/2	1 5/8 to 1 7/8	1 7/8 to 2 1/4	2 1/4 to 2 3/4	2 7/8 to 3 1/2	3 1/2 to 4 1/4	4 to 5	4 1/2 to 5 3/4	5 to 6 1/2	5 1/2 to 7 1/4	6 1/2 to 8 1/2	7 1/2 to 9 3/4	8 1/2 to 11	9 1/2 to 12 1/4	10 1/2 to 13 1/2
Capacity Depth, Ins.	1	1 1/2	1 5/8	1 3/4	1 7/8	2	2 1/8	2 1/8	2 1/2	2 1/2	2 3/4	2 3/4	2 3/4	3	3	3
Coarsest Threads, per Inch	14	11	11	11	11	8	8	8	8	8	8	8	8	8	8	8
Number of Chasers, per Set	4	4	4	4	4	6	6	6	6	6	6	6	6	8	8	10

Prices on application.

STOCKS AND DIES

LITTLE GIANT—FOR BRASS TUBING

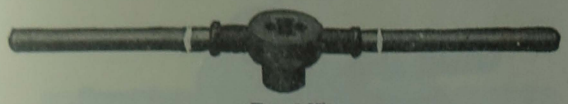

Fig. 167

American standard, all 27 straight threads to the inch; right hand dies furnished unless otherwise specified.

British standard, 26 threads to the inch, furnished at regular prices.

Left hand dies are special. Taps for these assortments are listed under taps.

DIES

Cutting Sizes, Inches			Each	Cutting Sizes, Inches		Each
NOS. 214 and 215	NOS. 216 and 217	NOS. 218 and 219		NOS. 216 and 217	NOS. 218 and 219	
1/4	1/4	1/4	$1.00	5/8	5/8	$1.75
5/16	5/16	5/16	1.00	3/4	3/4	2.00
3/8	3/8	3/8	1.25	.....	7/8	2.75
7/16	7/16	7/16	1.25	.....	1	2.75
1/2	1/2	1/2	1.50	.....	.....	.....

STOCKS COLLETS

Stock NOS.	Length, Inches	Each	Stock NOS.	Cap, Each	Guide, Each	Complete, Each
214-15	14 1/2	$1.50	214-15	$0.30	$0.20	$0.50
216-17	23	3.00	216-17	.50	.20	.70
218-19	26	3.00	218-19	.50	.20	.70

When ordering give full information such as diameter of Collet, thread standard, length of Stock, etc.

ALUMINUM STOCK AND DIES

FOR THIN METAL TUBING

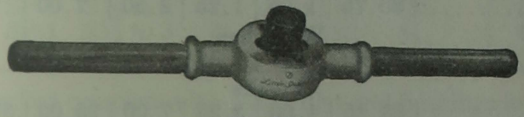

Fig. 168

Made of aluminum with wooden handles and internal guides. The internal wooden guides support the tubing and guard it against being crushed or distorted. Nickeled pipe cannot be marred on the surface when using the internal guides. These stocks are equipped with "Little Giant" dies, a two-piece die, each half having two cutting edges. The edges of the die are beveled to the same angle as the beveled edges of the slot in the cap in which it is held. A small screw at each end of the slot enables the workman to adjust the halves to the exact size. The die may be reversed so that work can be threaded either through the guide or from the face. A screw-guide wedges the die tight, and as it is held in a three-angle grip it cannot tilt out of alignment.

When the screw-guide is tightened, it becomes practically a solid die, possessing all the rigidity of a solid piece of metal. It is easily taken apart and the die sharpened, and re-assembled in no time. Furnished with right hand dies, 27 threads to the inch.

Each

NO. 276—Complete with Stock; Internal Guides and Dies for any Three Sizes; 1, 1 1/8, 1 1/4, 1 3/8 or 1 1/2 Inches; Length Stock, 20 Inches; Weight Complete, 2 1/2 Lbs..... $12.00

NO. 277—Complete with Dies for any Two Sizes, 1 3/4, 2, 2 1/4 Inches; Length Stock, 30 Inches; Weight Complete, 3 Lbs..... 20.00

Each Set in a Plain Strong Box.

WATER MAIN TAPPING MACHINES

MUELLER

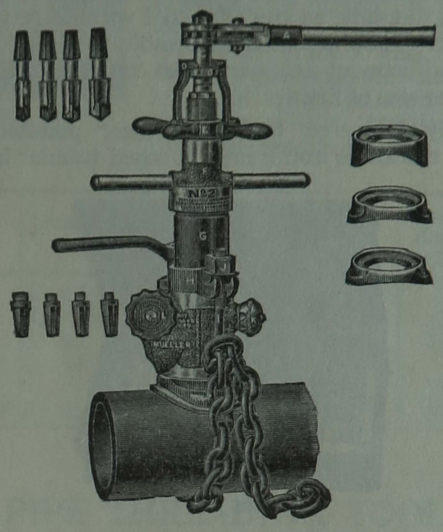

Fig. 169

For tapping water mains and inserting corporation cocks under pressure. Boring bar collar is constructed with a friction washer which prevents feed yoke binding on the collar.

Stuffing nut is located inside of the cap, therefore in repacking the use of more or less material does not interfere with the exactness of the mark on the boring bar indicating the correct depth to tap. The boring bar is of selected grade of steel and is ground full length so that packing fits perfectly at every point. The cylinder is made of the best of seamless steel tubing; body and cap are of red brass; the gate valve has rubber faced seat disc; the by-pass has two special composition washers; the gaskets are of flexible pure gum rubber. With a complete equipment of tools this machine will make taps and insert corporation cocks from 3/8 to 1 inch size in pipe under pressure and will make taps only from 1 to 2 inch size in dry or open pipe, but will not insert a cock above one inch.

This machine is intended for use on cast iron pipe, but can be used on wrought iron pipe in connection with a Mueller Water Main Tapping Machine Pattern Service Clamp. When pressure exceeds 90 pounds power clevis must be used.

Standard equipment includes: Ratchet handle, combined feed nut and yoke; tools with Mueller threads, sizes 1/2, 5/8 and 3/4 inch; plugs, male screw, sizes 1/2, 5/8 and 3/4 inch; iron saddles for 4, 6, 8 and 10 inch cast iron pipe; small rubber gaskets for top of saddles; large rubber gasket for all sizes of cast iron or wrought iron pipe; chain for pipe up to 12 inches; chain wrench and body cleaning chisel.

The following may be substituted—Tools with I. P. thread; plugs, female screw, except 3/8 inch, instead of male screw; four saddles furnished, for any size of cast iron pipe; chain furnished, for any size pipe larger than 12 inches.

Each

NO. B—Pipe Capacity, 2 to 48 Inches; Taps 3/8 to 2 Inches; Inserts Corporation Cocks up to 1 Inch; Height when resting on Pipe, 27 3/4 Inches; Length Ratchet, 16 3/8 Inches; Weight Each, packed, 117 Lbs..... $130.00

PIPE STOCKS AND DIES

ARMSTRONG PATTERN

The Dies can be adjusted to the variations in the size of fittings and by reason of their peculiar cutting edge can be worked rapidly and with little labor. The great degree of taper at the entrance allows easy starting. They can be sharpened the same as any edge tool without returning to the maker. They are interchangeable in the stocks and the only adjustment necessary is to conform to the variations in the size of fittings.

Carefully tempered tool steel dies; polished finish. Japanned malleable iron frame, polished tubular handles.

Fig. 170

ADJUSTABLE SINGLE END DIES

Stock Nos.	No. of Dies	Capacity, Inches	Weight Each, Lbs.	Right Hand, Each	Right and Left Hand, Each
1	4	1/8 to 1/2	5 1/2	$9.00	.....
1	8	1/8 to 1/2	6 1/4	.....	$14.00
2	5	1/4 to 1	14 3/4	12.00	.....
2	6	1/8 to 1	15 1/2	14.00	.....
2	10	1/4 to 1	18 1/4	.....	20.00
2	12	1/8 to 1	19 3/4	.....	22.00
3	3	1 1/4 to 2	35	18.00	.....
3	4	1 to 2	40	21.00	.....
3	5	3/4 to 2	44	24.00	.....
3	6	1/2 to 2	48	27.00	.....
3	6	1 1/4 to 2	44	.....	30.00
3	8	1 to 2	50	.....	37.00
3	10	3/4 to 2	56	.....	44.00
3	12	1/2 to 2	63	.....	51.00

One Set in Plain Shipping Box

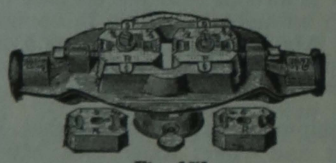

Fig. 171

ADJUSTABLE DOUBLE END DIES

Stock Nos.	No. of Dies	Capacity, Inches	Weight Each, Lbs.	Right Hand, Each	Right and Left Hand, Each
2 1/2	2	1/2 to 1 1/4	17 1/4	$14.00	.....
2 1/2	4	1/4 to 1 1/4	21	20.00	.....
2 1/2	8	1/4 to 1 1/4	25 3/4	.....	$27.00
2 1/2	4	1/2 to 1 1/4	19 3/4	.....	21.00
6	1	2 1/2 to 3	43	45.00	.....
6	2	2 1/2 to 3	49	.....	60.00
7	2	2 1/2 to 4	78	75.00	.....
7	1	3 1/2 to 4	58	55.00	.....
7	4	2 1/2 to 4	99	.....	110.00
7	2	2 1/2 to 3	99	.....	75.00
7	2	3 1/2 to 4	99	.....	75.00

One Set in Plain Shipping Box

RATCHET ATTACHMENTS

FOR ARMSTRONG STOCKS AND DIES

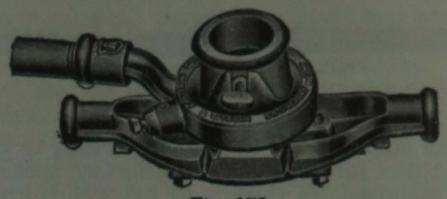

Fig. 172

MODEL B

All parts interchangeable. Dirt and chip proof. Can be used either right or left hand by reversing pawl, without removing from stock. Made of malleable iron.

For Stock Nos.	2	2 1/2	3	6	7
Weight Each, Lbs.	3	4	6 1/4	11 3/4	13 1/2
Each	$2.50	3.00	3.50	5.00	5.00

REPAIR PARTS

To Fit Armstrong Pattern Pipe Stocks Nos.

	1	2	2 1/2	3	6	7
Right or Left Hand Single End Dies						
Each	$1.60	2.00	2.50	4.50	....	....
Right or Left Hand Double End Dies						
Each	....	....	3.50	....	17.00	20.00
Bushings						
Each	$0.30	.40	.60	.75	2.00	3.00
Collar Screws						
Each	$0.25	.30	.35	.50	.50	.50
Adjusting Screws						
Each	$0.20	.25	.35	.40	.40	.40
Leader Screws						
Each	....	....	....	....	$4.00	5.00
Thumb Screws						
Each	$0.20	.30	.30	.50	....	....
Handles						
Set	$0.75	1.25	1.25	2.50	7.00	7.00
Wrenches						
Each	$0.20	.25	.25	.30	.30	.30
Stocks						
Each	$3.25	4.00	5.25	7.00	25.00	30.00

SOLID PIPE DIES

NYE

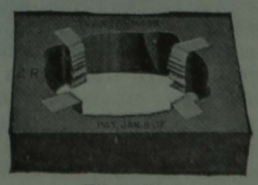

Fig. 173

Have the rounded bottom "skip" tooth feature which allows ample clearance for escape of chips and oil. The chasers are cast into a block of metal and the angle of rake is made absolutely true.

For Pipe, Inches	1/8	1/4-3/8	1/2	3/4	1
2x2x1/2 Inches, Each	$2.00	2.50	3.00	....	....
2 1/2x2 1/2x3/4 Inches, Each	$2.00	2.50	3.00	3.00	3.50
3x3x3/4 Inches, Each	$2.50	3.00	3.50	3.50	4.00
4x4x7/8 Inches, Each	....	....	....	$4.00	4.00	4.50

For Pipe, Inches	1 1/4	1 1/2	2	2 1/2	3
3x3x3/4 Inches, Each	$4.00	4.50	....	....	....
4x4x7/8 Inches, Each	$4.50	5.00	5.00	....	....
5x5x1 1/4 Inches, Each	....	....	....	$13.00	14.00

PIPE STOCKS AND DIES

Q & E

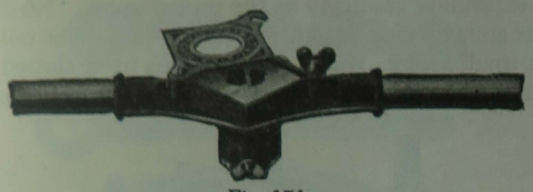

Fig. 174

Stocks are made of malleable iron; dies are of high-grade steel. Stock, handles, and all other parts of these sets are interchangeable with the same parts for the bolt sets, except No. 3 SP, and 4 SP. Handles are polished perfectly smooth and have rounded ends. Sizes from No. 2 SP and larger have a lead screw to aid in starting the threads on pipe. All stocks furnished with two handles except No. 4 SP, which has four. Supplied with "Q & E" dies which have easy cutting qualities and give clean, smooth threads. Dies can be supplied in Briggs or Whitworth standard, right or left hand. Right-hand Briggs standard sets will be furnished unless otherwise ordered.

NOS.	Threads Pipe, Inches	Outside Dimensions of Dies, Inches	Weight Each, Lbs.	Per Set
0 SP-1	1/8 to 1/2	2 x2 x 1/2	6 1/2	$8.00
1 SP-1	1/4 to 1	2 1/2 x2 1/2 x 3/4	13	10.50
1 SP-2	1/8 to 1	2 1/2 x2 1/2 x 3/4	14	12.00
1 SP-3	1/8 to 3/4	2 1/2 x2 1/2 x 3/4	13	10.50
1 SP-4	1/2 to 1	2 1/2 x2 1/2 x 3/4	12	7.50
1 1/2 SP-1	3/4 to 1 1/4	3 x3 x 3/4	14	9.50
1 1/2 SP-3	1/4 to 1 1/4	3 x3 x 3/4	22	15.50
1 1/2 SP-5	1/2 to 1 1/4	3 x3 x 3/4	16	11.50
2 SP-1	1 1/4 to 2	4 x4 x 7/8	25	14.50
2 SP-2	1 to 2	4 x4 x 7/8	29	17.00
2 SP-3	3/4 to 2	4 x4 x 7/8	33	19.50
2 SP-4	1/2 to 2	4 x4 x 7/8	37	22.00
3 SP-1	2 1/2 to 3	5 x5 x1 1/4	68	35.00
4 SP-1	2 1/2 to 3	5 x5 x1 1/4	84	42.00

Packed complete with stock, dies and bushings in a box with hinged cover. Nos. 3SP and 4SP are packed in plain box.

BUSHINGS

Fig. 175

Bushings are turned faced and bored.

NOS.	0SP	1SP
Weight Each, Lbs.	1/8	1/4
Each	$0.30	.40

NOS.	1 1/2SP	2SP	3SP	4SP
Weight Each, Lbs.	1/2	1	2	2
Each	$0.60	.75	2.00	2.00

DIE FRAMES

NOS.	1SP	1 1/2SP
Takes Dies, No.	0	1
Weight Each Lbs.	1/8	9/16
Each	$0.30	.40

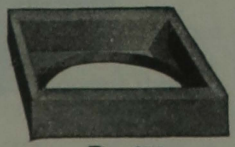

Fig. 176

NOS.	2SP	2SP	3SP	4SP
Takes Dies, No.	1	1 1/2	2	2
Weight Each, Lbs.	2 1/2	1 3/4	4 1/4	4 1/4
Each	$0.80	.50	.60	.60

PIPE DIES

Q & E

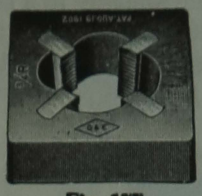

Fig. 177

The chasers or cutting bits in these dies are inclined at an angle to the surface of the pipe. Consequently in threading the material is shaved off, instead of being scraped off. Made of the highest grade of steel in Briggs or Whitworth Standard, both right and left-hand. Right-hand Briggs Standard dies will be furnished, unless otherwise specified.

NOS.	Dimensions, Inches	Sizes, Right or Left	Weight Each, Lbs.	Each
0 SP	2 x2 x 1/2	1/8, 1/4, 3/8, 1/2,	1/4	$1.40
1 SP	2 1/2 x2 1/2 x 3/4	1/8, 1/4, 3/8, 1/2,	1	1.60
1 1/2 SP	3 x3 x 3/4	1 1/4,	1 1/3	2.00
2 SP	4 x4 x 7/8	1/2, 3/4, 1, 1 1/4, 1 1/2, 2	2 3/4	2.50
3SP-4SP	5 x5 x1 1/4	2 1/2 or 3	8 1/2	9.00

PIPE THREADING TOOLS

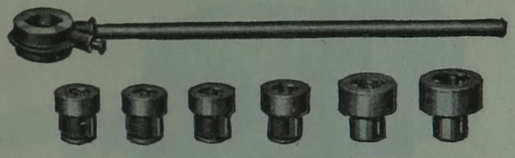

Fig. 178

BEAVER, JR.

Consists of ratchet handle and separate heads for each size die; no loose dies or bushings can be used in ditches, close to walks, between rafters and other restricted places.

Per Set

NO. 3—Capacity 1/8 to 1 Inch; Weight Per Set, 14 Lbs. $24.00

Each Set in a Wooden Box

Parts

	Each
Ratchet Handle	$4.00
Extra Dies, 4 Chasers, any size	2.50
Die Heads, 1/8, 1/4 or 3/8 Inch	3.00
Die Heads, 1/2 or 3/4 Inch	3.50
Die Heads, 1 Inch	4.00

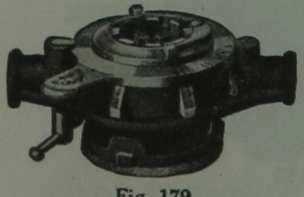

Fig. 179

BEAVERETTE

Uses narrow dies which operate similarly to a lathe tool, gradually expanding as the thread is cut. Die cam is revolved by a slotted post which controls the taper. Does not require change of dies in going from one size to another, except that two sets are needed because 1/4 and 3/8 inch and 1/2 and 3/4 inch threads have a different number of threads to the inch.

Has three-jaw cam centering device which does away with loose bushings. Jaws are made of hardened tool steel.

Each

NO. 6—Capacity, 1/4, 3/8, 1/2, 3/4 Inches; Weight Each, 8 Lbs. $15.00

Extra Dies, per Set 3.00

PIPE THREADING TOOLS

BEAVER

Tools use narrow dies which operate similarly to a lathe tool, expanding gradually as the thread is cut. No dies to change. Every stock is a complete unit and will thread two to four sizes of pipe without changing dies. The only adjustment to change from one size pipe to another is to shift a small lever. Die cam is revolved by a slotted post which controls the taper. Dies are made of vanadium steel and can be sharpened on an ordinary grindstone.

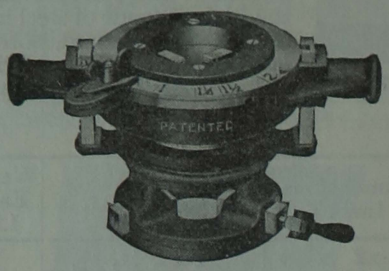

Fig. 180

Has no loose parts to become lost. Contains a universal Chuck which eliminates grip screws and bushings. Die adjustment from one size to another is quickly made.

Each

NO. 25—Capacity, 1, 1¼, 1½, 2 Inches; Weight Each, 22 Lbs. **$30.00**
Extra Dies, Per Set **3.50**

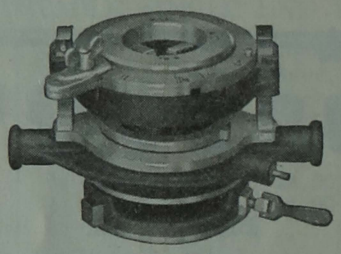

Fig. 181

RATCHET TYPE

Similar to No. 25 but equipped with a ratchet. Especially designed for use in ditches, or other places where working space is limited. While this tool has ratchet movement, two handles are supplied which can be used when desired.

Each

NO. 26—Capacity 1, 1¼, 1½, 2 Inches; Weight Each, 24 Lbs. **$35.00**
Extra Dies, Per Set **3.50**

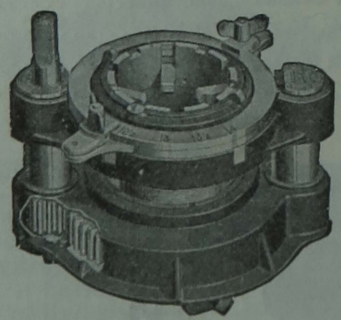

Fig. 182

GEARED RATCHET

Compact and powerful with the capacity of a machine. Cuts pipe in ditch as well as at bench. Steel construction, bronze bushings, protected gearing, etc. One set of dies threads all sizes. A one-man tool.

Each

NO. 41—Capacity 2½, 3, 3½, 4 Inches; Weight Each, 60 Lbs. **$110.00**
Extra Dies, Per Set **9.00**

Also made to thread oil-well casing and other special threads.

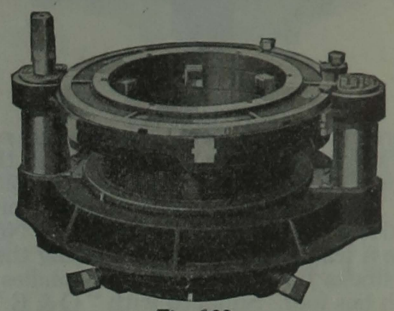

Fig. 183

GEARED RATCHET

A One-Man Tool

Two sets of dies are used to cover the large range in cutting sizes. Each die is a separate unit, leaving threading strain on side wings. No strain on adjusting cam.

Each

NO. 61—Capacity 2½ to 6 Inches; Weight Each, 150 Lbs. **$220.00**
Extra Dies—2½-3 inches or 4-6 inches, **Per Set,** **14.00**

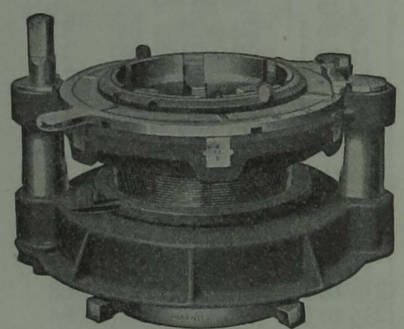

Fig. 184

GEARED RATCHET

Similar to No. 61. The driving pinion is supported at both ends. Every bearing is bronze bushed. Will operate anywhere, for threading bends and in confined places.

Each

NO. 80—Capacity 4½ to 8 Inches; Weight Each, 155 Lbs. **$300.00**
Extra Dies—4½-6 inches or 7-8 inches, **Per Set,** **20.00**

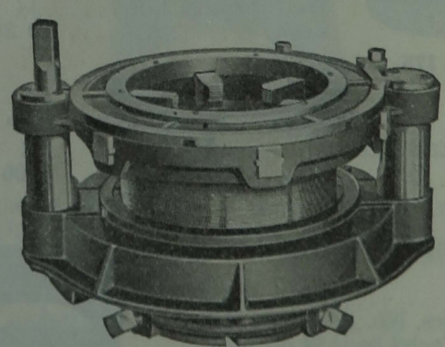

Fig. 185

GEARED RATCHET

Similar to No. 80. Will thread 12-inch pipe with comparative ease. Made entirely of steel without excessive weight.

Each

NO. 90—Capacity 9 to 12 Inches; Weight Each, 250 Lbs. **$500.00**
Extra Dies—9-10 inches or 11-12 inches, **Per Set,** **30.00**

PIPE THREADING TOOLS

TOLEDO

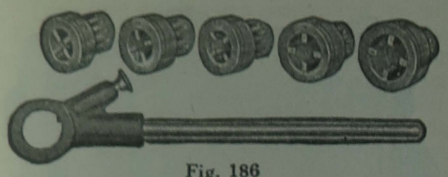

Fig. 186

RATCHET

For small sizes of pipe; works with little labor. Produces perfectly true tapered threads of standard size. To use, it is only necessary to place the die-head on the ratchet and pull back the pawl, when the die-head drops into place ready for duty. Can be used to thread pipe in the closest corners. Die-heads can be bought as wanted.

	Each
NO. 00—Complete with Five Die-heads in nicely Finished Oak Case; Capacity, ⅛ to ¾ Inches; Weight, 10 Pounds	$20.00
Ratchet only, Each	3.00
⅛ to ⅜ Die-heads only, with Dies, Each	3.00
½ to ¾ Die-heads only, with Dies, Each	3.50
Extra Dies, Per Set	2.00
Oak Case only, Each	1.00

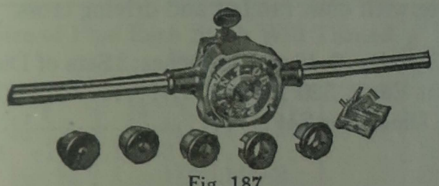

Fig. 187

ADJUSTABLE, WITHOUT RATCHET

Very light and compact; one set of dies is used for threading ⅛ inch pipe. another set for ¼ and ⅜ inch, and a third for ½ and ¾ inch Receding-die feature for ½ and ¾ inch pipe makes very easy operation on those sizes.

	Each
NO. 0—Capacity ⅛ to ¾ Inches; 3 Sets of Dies; Length over All, 24 Inches; Weight Each, 7 Pounds	$16.00
Extra Dies, Per Set	2.50

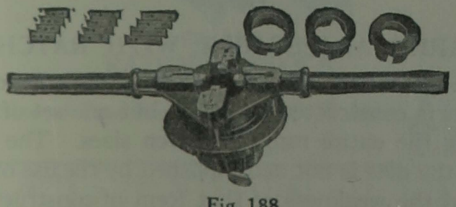

Fig. 188

ADJUSTABLE, WITHOUT RATCHET

The operation of this tool is so easy that a thread can readily be cut on a 2-inch pipe by one man.

Threads of standard taper or straight lock-nut threads, or "pitch" threads may be cut without straining tool, and without extra labor.

	Each
NO. 1—Capacity 1 to 2 Inches; 4 Sets of Dies; Weight Each, 18 Pounds	$24.00
Extra Dies, Per Set	2.50

Furnished for either right-hand or left-hand threads; right-hand furnished unless otherwise ordered.

PIPE THREADING TOOLS

TOLEDO

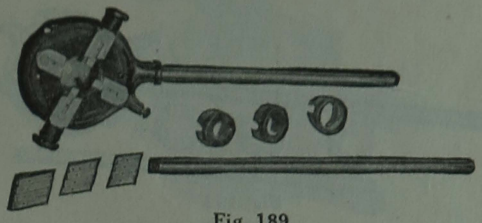

Fig. 189

ADJUSTABLE, WITH RATCHET

It may be used with two handles as an ordinary die stock, or with one handle inserted in the ratchet case. It is desirable for threading pipe down in a trench, or against walls, between rafters, etc. Right-hand furnished unless otherwise specified.

	Each
NO. 1A—Capacity, 1 to 2 Inches; 4 Sets of Dies; Weight Each. 22 Pounds	$30.00
Extra Dies, Per Set	2.50

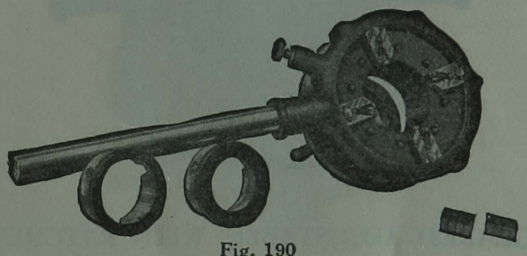

Fig. 190

ADJUSTABLE, WITH RATCHET

Operates with ratchet only. Works direct without gearing, but one man can easily thread pipe up to the capacity of the tool. Regularly furnished to cut standard pipe thread.

	Each
NO. 1½R—Capacity, 2½ to 3 Inches; 2 Sets of Dies; Weight Each, 38 Pounds	$50.00
Extra Dies, Per Set	4.00

Can be furnished for cutting special 11½ pitch threads as used by oil-well operators when so ordered.

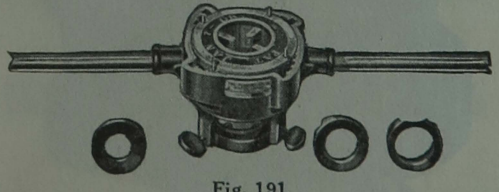

Fig. 191

ADJUSTABLE, WITHOUT RATCHET

Entirely self-contained, threading the entire range of sizes with one set of dies. There is no cam die-shifting mechanism, nor other intricate parts. Dies are easily and positively set for any given size. Die-receding principle is utilized, and it threads pipe with very little effort.

	Each
NO. 10—Capacity 1 to 2 Inches; Weight Each, 16½ Pounds	$28.00
Extra Dies, Per Set	2.75

PIPE THREADING TOOLS

TOLEDO

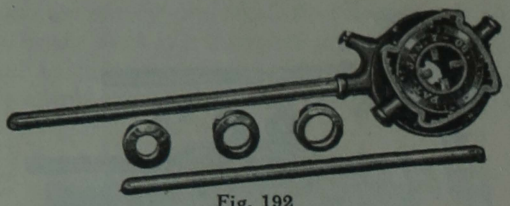

Fig. 192

ADJUSTABLE, WITH RATCHET

One set of dies threads the entire range of sizes. Dies are easily and positively set for any given size. The die-receding principle is embodied in this tool.

	Each
NO. 10A—Capacity, 1 to 2 Inches; Weight Each, 22 Pounds	$34.00
Extra Dies, Per Set	2.75

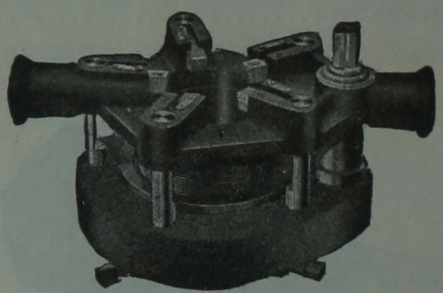

Fig. 193

GEARED ADJUSTABLE, WITH RATCHET

Light, compact and very easy in operation. Neither is the ease of operation obtained at the expense of speed.

It is claimed that a 4-inch thread may be completed in 10 minutes without undue effort, and that a 4-inch thread has been cut in 6 minutes.

Complete with dies, ratchet and driving cross.

	Each
NO. 2—Capacity, 2½ to 4 Inches; 4 Sets of Dies; Weight Each, 88 Pounds	$100.00
Extra Dies, Per Set	8.00

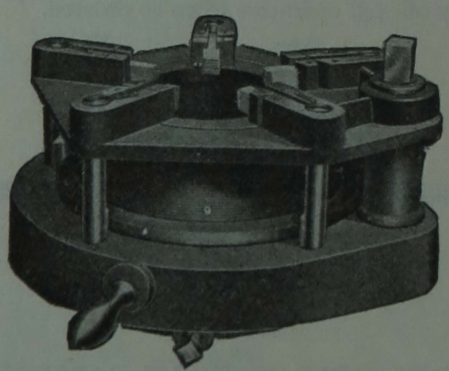

Fig. 194

GEARED ADJUSTABLE, WITH RATCHET

Light, compact and easy of operation. With clearance in other directions it may be operated on a pipe, the center of which is within 10 inches of a wall or other obstruction.

Complete with dies, ratchet and driving cross.

	Each
NO. 3—Capacity, 4½ to 8 Inches; 5 Sets of Dies; Weight Each, 217 pounds	$300.00
Extra Dies, Per Set	12.00

PIPE THREADING TOOLS

TOLEDO

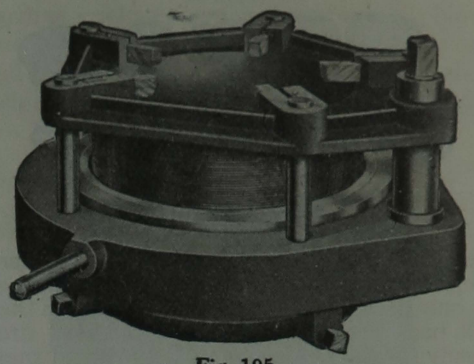

Fig. 195

GEARED ADJUSTABLE, WITH RATCHET

Designed for use in large power plants, pipe lines or any place where it is necessary occasionally to cut threads on large size pipe. Works readily in restricted places and pipe in a line may be threaded. In close quarters the ratchet handle is used, and where there is room greater speed is attained by the use of the driving cross.

It takes two men to put the tool on the pipe, but after it is on, one man can do the work of cutting the thread.

Complete with dies, ratchet and driving cross.

	Each
NO. 4—Capacity, 9, 10 and 12 Inches; 3 Sets of Dies; Weight Each, 320 Pounds	$500.00
Extra Dies, Per Set	20.00

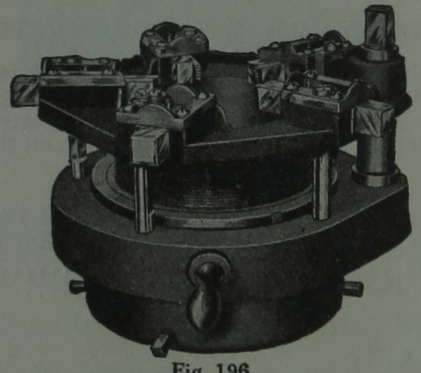

Fig. 196

GEARED ADJUSTABLE, WITH RATCHET

Model differs from other Toledo tools of similar capacity in that it is constructed to utilize but one set of dies for threading the entire range of seven sizes. The adjustment of the dies is not accomplished by the use of a cam-plate and the weakness of that form of construction has therefore been eliminated. Two sets of dies are furnished with this model, so that when one set is dull and needs grinding another set will be on hand to take its place.

Can be used to good advantage in restricted places in connection with the ratchet handle. Where the space permits the use of the driving cross, greater speed can be attained.

Complete with dies, ratchet and driving cross.

	Each
NO. 25—Capacity, 2½ to 6 Inches; Weight Each, 207 pounds	$230.00
Extra Dies, Per Set	8.00

PIPE THREADING TOOLS

BULL DOG

These die stocks are strongly made and have few working parts. Dies and guides are controlled by small lever handles. Can be set for any size and will stay set without locking. Opened or closed with one movement of top lever. Dies are changed from one size to another by movement of bottom lever. Stock is ready for cutting when both lever handles are turned to the right. By moving top lever to the left the dies are expanded to clear the pipe, when the stock can be lifted off without backing dies over the finished threads.

Equipped with adjustable guides which do away with loose bushings. Guides operate on a scroll and can be set for all sizes the tool will thread. The scroll is constructed so that the guides are held in any position without locking. The more pressure on the ends of the guides, the more solid the locking arrangement.

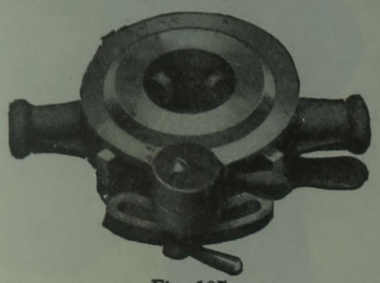

Fig. 197

REGULAR STOCK

NOS.	Size of Pipe Each Stock Will Thread, Inches				Wgt. Each, Lbs.	Each
101	⅛	¼–⅜	½–¾	.....	7	$13.00
102	¼–⅜	½–¾	1 –1¼	.....	14	17.00
103	1 –1¼	1½–2	.....	.....	20	22.00
104	½– ¾	1 –1¼	1½–2	.....	21	25.00
104½	¼– ⅜	½– ¾	1 –1¼	1½–2	22	28.00
105	1½–2	2½–3	.....	.....	35	40.00
105½	1–1¼	1½–2	2½–3	.....	37	43.00
107	2½–3	3½–4	.....	.....	45	55.00
107½	1½–2	2½–3	3½–4	.....	47	58.00

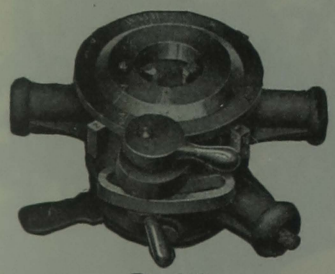

Fig. 198

RATCHET STOCK

NOS.	Size of Pipe Each Stock will Thread, Inches				Wgt. Each, Lbs.	Each
102R	¼–⅜	½– ¾	1 –1¼	.....	18	$20.00
103R	1 –1¼	1½–2	.....	.....	25	27.00
104R	½– ¾	1 –1¼	1½–2	.....	26	30.00
104½R	¼– ⅜	½– ¾	1 –1¼	1½–2	41	33.00
105R	1½–2	2½–3	.....	.....	46	50.00
105½R	1 –1¼	1½–2	2½–3	.....	48	53.00
107R	2½–3	3½–4	.....	.....	63	60.00
107½R	1½–2	2½–3	3½–4	.....	65	63.50
108R	.....	2½–3	3½–4	4½–5	90	75.00
108½R	1½–2	2½–3	3½–4	4½–5	93	80.00

EXTRA DIES

Right or Left Hand, 4 Pieces to a Set

NOS.	101	102	103	104	104½
Per Set	$2.50	3.00	3.50	3.50	3.50
NOS.	105	105½	107	107½	108	108½
Per Set	$5.00	5.00	6.00	6.00	10.00	10.00

PIPE THREADING TOOLS

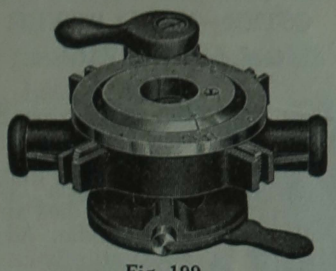

Fig. 199

Double-end dies (¼ and ⅜-inch on one end—½ and ¾-inch on the other) protected by a casing so teeth cannot cut user's hands or be damaged when stock is thrown about.

The dies have a stop on each side so that they cannot be set beyond proper place in stock.

When once set, one movement of lever handle opens dies for taking from pipe without backing over the finished thread and one movement resets them.

	Each
NO. 82—Capacity ¼, ⅜, ½, ¾ Inch, Weight Each, 6 Lbs.	$13.00
Dies, R or L, per Set (4 pieces)	3.50
Dies, ⅛ inch, per Set (4 pieces)	3.50

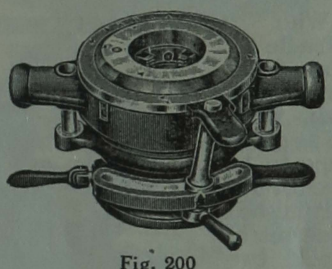

Fig. 200

MATCHLESS

Equipped with narrow receding dies which automatically expand as the thread progresses to give the proper taper to the thread. Work is gripped by an adjustable universal chuck, and the dies as they revolve are drawn forward at the proper pitch by the leader screw. A shield protects the leader screw from dust and chips. Dies are adjustable to variations in pipe sizes and can be opened for removal from the pipe without backing the dies over the finished threads.

WITHOUT RATCHET

NOS.	1B	3B
Threads Pipe, Inches	½–¾	1–2
Weight Each, Lbs.	10	25
Each, Complete	$14.50	30.00
Extra Dies, per Set	$2.50	3.50

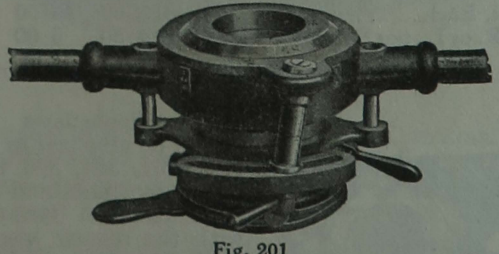

Fig. 201

WITH RATCHET

Similar to above item but with ratchet.

NOS.	3BR	4BR
Threads Pipe, Inches	1–2	2½–4
Weight Each, Lbs.	36	120
Each, Complete	$35.00	80.00
Extra Dies, per Set	$3.50	10.00

Supplied with Right Hand Dies only.

PIPE THREADING MACHINES

OSTER—HAND POWER

Geared, With Ratchet

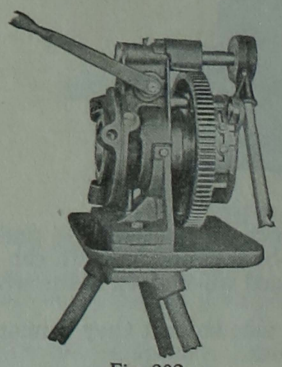

Fig. 202

Light hand machine for threading large size pipe. Ratchet lever is used for the larger sizes and a crank handle for the smaller sizes. No lead screw is used and dies are started by a lever handle. Adjustable guides automatically center the pipe in the dies. No pipe vise is required. Furnished with tripod or bench bracket. Cutting off attachment can not be used with these machines. No. 16 can be supplied with right-hand dies only; No. 17, with either right or left.

NOS.	16	17
Threads Pipe, Inches	2½ to 4	2½ to 6
Sets of Dies	1	4
With Tripod, Pan, Lbs.	275	500
Each, with Bench Bracket	**$110.00**	**185.00**
Each, with Tripod	**$125.00**	**200.00**
Extra Dies, per Set (Four Pieces)	**$ 9.00**	**11.00**

Geared, With Crank Handle

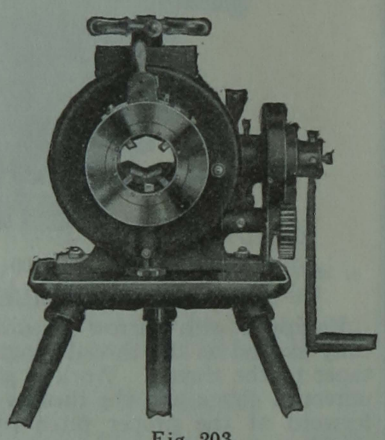

Fig. 203

Dies are opened and closed by small lever handle, which, when thrown out of its notch will allow pipe to be removed without turning back over finished threads. One set of dies will thread two sizes of pipe. Change of dies quickly made without removing any part of machine. Furnished with self-centering pipe vise and with cut-off attachment operated by a star wheel. When wheel strikes the pawl it feeds the cutter automatically. When pipe is cut off, the pawl is thrown back and machine is again ready for threading. Has two speeds and change from one to the other can be made while threading. Supplied with bench bracket or tripod stand or arranged for belt power.

NOS.	201	204	206
Threads and Cuts off Pipe, Inches	¼ to 2	1 to 4	1 to 6
Sets of Dies	4	4	4
Shipping Weight Each, Lbs.	275	575	975
Each, without Tripod	**$90.00**	**210.00**	**337.50**
Tripod, Each	**$15.00**	**15.00**	**37.50**
Dies, R. or L., per Set (Four Pieces)	**$ 4.50**	**6.00**	**7.50**

No. 201 has one speed and no cutting-off attachment.

Nipple Jaws

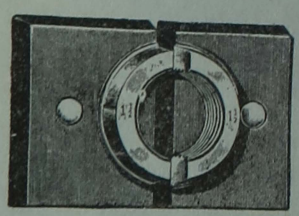

Fig. 204

Can be attached to vise of Nos. 301, 304, 306 type A and B machines and to No. 316 C machine. Jaws expand with the regular vise jaws. Will allow close nipples to be threaded. No screwing of nipple. A half turn of handwheel opens jaws and nipples drop out. Made of steel, case hardened.

NOS.	300	304	306
Per Set (Two Pieces)	**$11.00**	**11.00**	**15.00**

One set will hold one size nipple only.

PIPE THREADING MACHINES

OSTER—POWER DRIVEN

These machines will take care of all ordinary pipe threading jobs. Will thread long or short, straight or bent pieces over or under size, nipples any size and all thread nipples. Work is always in view of operator and operating parts are under instant control. Has lever controlled die head which is released and rises instantly after the thread is finished. Vise grips work by single turn of wheel, bringing it to a center. Automatic die release for cutting threads equal length is furnished. When adjusted, will open die automatically and remove work without attention of operator. Can be set for any length thread. Geared oil pump feeds oil to each die no matter what position the die is in.

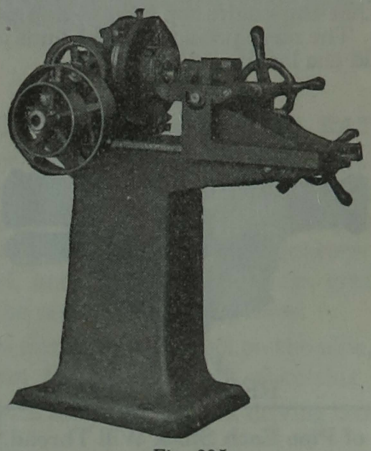

Fig. 205

Belt Driven

Complete with countershaft, automatic cut-off apparatus, automatic die release and four sets of right-hand pipe dies.

	Each
NO. 300A—Capacity, ¼ to 2 Inches; Height, 45 Inches; Length, 36 Inches; Width, 28½ Inches; Floor space, 22x19 Inches; Countershaft speed, 140 R.P.M.; Power required, ¾ H.P.; Weight Each, 800 Pounds	**$315.00**
Extra Dies, R. or L. H., per Set	**$4.50**

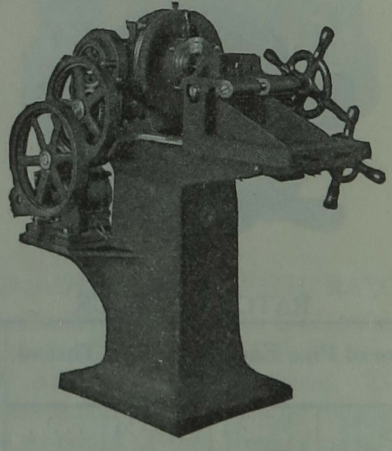

Fig. 206

Motor Driven

Complete with motor; automatic cut-off apparatus; automatic die release and four sets of right-hand pipe dies.

	Each
NO. 300B—Capacity, ¼ to 2 Inches; Height, 46 Inches; Length, 44 Inches; Width, 26 Inches; Floor Space, 22x19 Inches; Motor, ¾ H.P., 1800 R.P.M.; Weight Each, 800 Pounds	**$465.00**
Extra Dies, R. or L. H., per Set	**$4.50**

Motor mounted on base direct connected. Supplied for either direct or alternating current. When ordering, state voltage, if direct current, and voltage cycles and phases, if alternating current. Machines are not supplied without motors.

PIPE THREADING MACHINES

OSTER—POWER DRIVEN

These machines will take care of all ordinary pipe threading jobs. Will thread long or short, straight or bent pieces, over or under size, nipples any size and all thread nipples.

Work is always in view of operator and operating parts are under instant control. Has lever controlled die head which is released and rises instantly after the thread is finished. Vise grips work by single turn of wheel, bringing it to a center. Automatic die release for cutting threads equal length is furnished. When adjusted, will open die automatically and remove work without attention of operator. Can be set for any length of thread. Oiling system feeds oil to each die, no matter what position the die is in. The force of oil is so great as to wash away all chips, thus adding to the life of the dies and producing smoother and better threads.

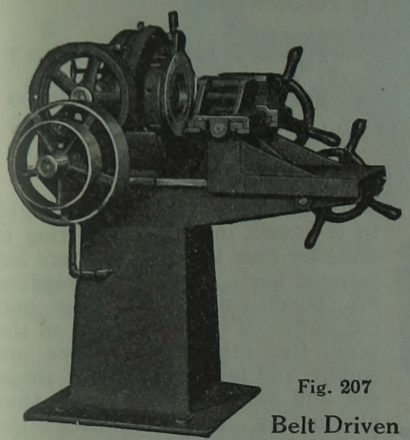

Fig. 207

Complete, with countershaft, geared oil pump, automatic cut-off apparatus, automatic die release, adjustable pipe rest stand and four sets of right hand pipe dies for No. 304 and six sets for No. 306 machine.

Belt Driven — **Each**

NO. 304A—Capacity, 1 to 4 Inches; Height, 47 Inches; Length, 43 Inches; Width, 35 Inches; Floor Space, 24x20 Inches; Countershaft Speed, 225 R.P.M.; Power required, 1½ H.P.; Weight, 1400 Pounds..... **$475.00**

Extra Dies, R. or L. H., per Set..... **$6.00**

NO. 306A—Capacity, 1¼ to 6 Inches; Height, 51 Inches; Length, 54 Inches; Width, 46 Inches; Floor Space, 30x25 Inches; Countershaft Speed, 120 R.P.M.; Power required, 1¾ H.P.; Weight, 2000 Pounds..... **$660.00**

Extra Dies, R. or L. H., per Set..... **$7.50**

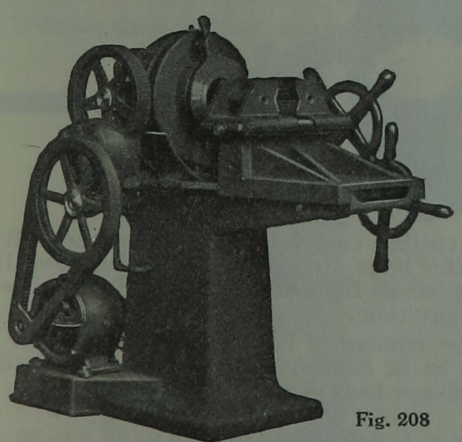

Fig. 208

Motor Driven

Same equipment as belt driven machine except that there is a motor mounted on the base and connected by a silent chain. **Each**

NO. 304B—Capacity, 1 to 4 Inches; Height, 48 Inches; Length, 51½ Inches; Width, 32 Inches; Floor Space, 24x32 Inches; Motor, 1½ H.P., 1800 R.P.M.; Weight Each, 1300 Pounds.... **$700.00**

Extra Dies, R. or L. H. per Set..... **$6.00**

NO. 306B—Capacity, 1¼ to 6 Inches; Height, 50¾ Inches; Length, 60 Inches; Width, 48 Inches; Floor Space, 35x33 Inches; Motor, 1¾ H.P., 1800 R.P.M.; Weight Each, 1950 Pounds..... **$925.00**

Extra Dies, R. or L. H., per Set..... **$7.50**

Motors supplied for either direct or alternating current. When ordering state voltage if direct current, and voltage cycles and phases if alternating current. On request, will change specifications to meet special requirements at additional charge.

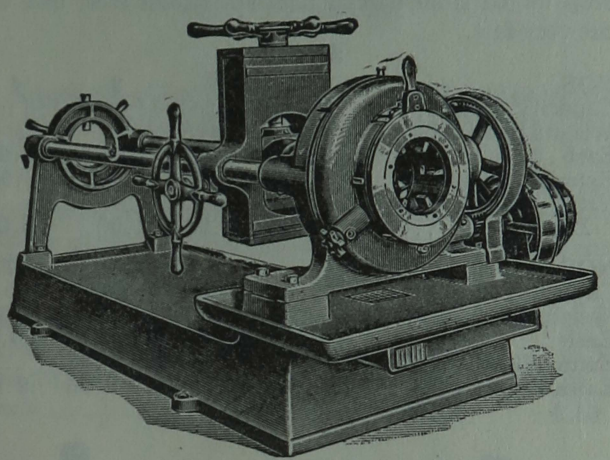

Fig. 209

Belt Driven

Complete with countershaft, geared oil pump, automatic cut-off apparatus and six sets of right hand dies. **Each**

NO. 308A—Capacity, 2½ to 8 Inches; Height, 52 Inches; Length, 105 Inches; Width, 58 Inches; Height to Center of Dies, 30¼ Inches; Floor Space, 39x85 Inches; Countershaft Speed, 82½ R.P.M.; Power required, 2½ H. P.; Weight Each, 4000 Pounds..... **$1200.00**

Extra Dies, R. or L. H. per Set..... **$15.00**

Price does not include Automatic Die Release.

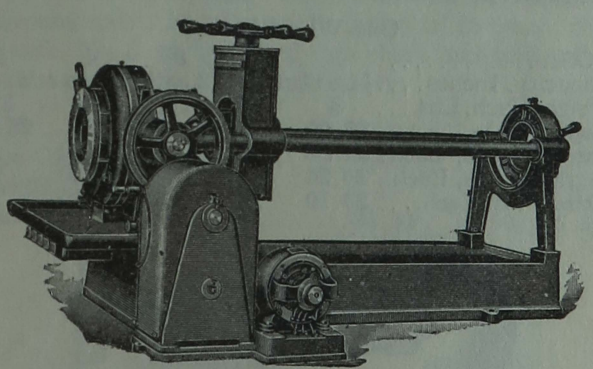

Fig. 210

Motor Driven

Complete with motor, geared oil pump, automatic cut-off apparatus and six sets of right hand dies.

Motor is direct connected with a rawhide pinion to insure quiet running. **Each**

NO. 308B—Capacity, 2½ to 8 Inches; Height, 52 Inches; Length, 105 Inches; Width, 68 Inches; Height to Center of Dies, 30¼ Inches; Floor Space, 62x85 Inches; Motor, 2½ H. P., 1550 R.P.M.; Weight Each, 4300 Pounds... **$1500.00**

Extra Dies, Right or Left Hand, per Set..... **$15.00**

Price does not include Automatic Die Release.

PIPE CUTTERS

Fig. 211

BARNES

Made of best material throughout. The wheels are drop forged from special high-grade tool steel and will cut very fast.

3-Wheel

NOS.	1	2	3	4
Capacity, Inches	⅛ to 1	½ to 2	1½ to 3	2½ to 4
Weight Each, Lbs.	3	4¼	8	12½
Each	$4.50	6.00	10.00	20.00
Extra Wheels, Each	$0.25	.30	.40	.50
Extra Wheel Pins, per Dozen	$1.00	1.00	1.00	2.00

NOS.	5	6	6½	7
Capacity, Inches	4 to 6	6 to 8	8 to 10	9 to 12
Weight Each, Lbs.	19½	24	35	51
Each	$30.00	40.00	45.00	50.00
Extra Wheels, Each	$ 0.75	.75	.75	.75
Extra Wheel Pins, Per Doz.	$ 2.00	2.00	2.00	2.00

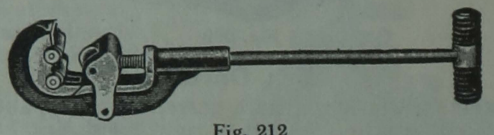

Fig. 212

SAUNDERS

Handle and frame of malleable iron; rollers, wheel and pins of tool steel, carefully hardened. Body is provided with rollers for the pipe to rest on, which lessens friction on pipe, serves also to roll down burr left by wheel in cutting. Hinged block which guides wheel and prevents it from breaking is so arranged that it cannot become detached and mislaid.

One-Wheel Roller

NOS.	1	2	3	4	5
Capacity, Inches	⅛ to 1	1 to 2	2 to 3	2½ to 4	4 to 6
Weight Each, Lbs.	3	6¼	11¾	15	23
Each	$3.00	4.50	11.00	18.00	28.00
Extra Wheels, Each	$0.24	.32	.60	.60	.60
Extra Rollers, Each	$0.24	.32	.50	.50	.60
Extra Pins, Each	$0.10	.10	.15	.15	.15

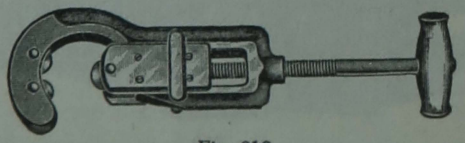

Fig. 213

ARMSTRONG

Cutters made from crucible steel hardened and tempered. Has a solid frame with steel tie that prevents springing. Furnished with two rollers so cutter may be used as single or 3-wheel.

One or Three-Wheel

NOS.	1	2	3
Capacity, Inches	⅛ to 1¼	½ to 2½	1½ to 4
Weight Each, Lbs.	4⅝	7	14½
Each	$4.50	6.00	15.00
Extra Wheels, Each	$0.25	.30	.50
Extra Rollers, Each	$0.25	.30	.50
Extra Pins, Each	$0.10	.10	.15

PIPE CUTTERS

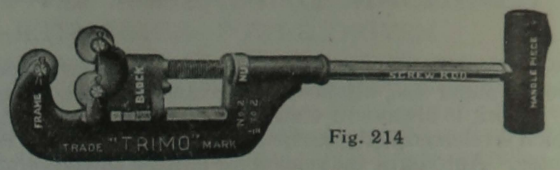

Fig. 214

The wheels are drop forged; have long hubs; ample bearing surface. No threads in frame or roll block to wear out.

One or Three-Wheel

NOS.	1	2	3
Capacity, Inches	⅛ to 1¼	½ to 2	1 to 3
Weight Each, Lbs.	5¼	6	8¾
Each	$4.50	6.00	10.00
Extra Wheels, Each	$0.40	.40	.50
Extra Rollers, Each	$0.30	.30	.40
Extra Pins, Each	$1.30	1.30	1.30

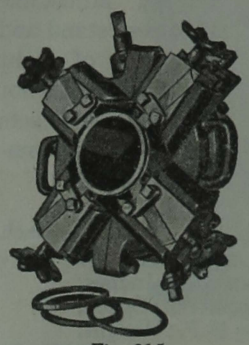

Fig. 215

For hand operation; capacity 2½ to 6 inches, inclusive. Cutting is done by four knives which are fed by hand feeds. Two of these knives are beveled across the edge and cut out a "V" shape section of the pipe; the other two knives are square and follow in the "V" shape cut and sweep out the edges, thus eliminating any tendency the knives might have to bind in the cut.

It will cut off extra heavy or double extra heavy pipe. Fastened to the pipe by a three-jawed chuck, each jaw is actuated independently and contains a set of size marks for quick centering on the pipe. Can also be split in the middle for use on pipe already inserted in a line.

	Each
NO. 250—With Ratchet Handle; Weight Each, 115 Lbs.	$80.00

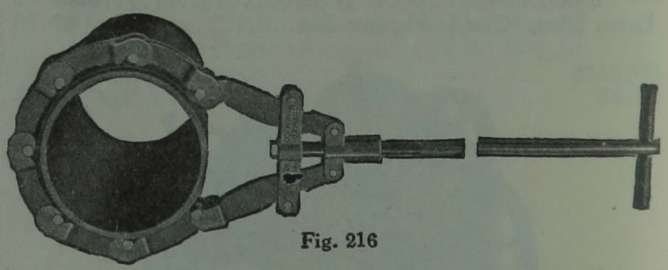

Fig. 216

For cutting cast iron pipe in trenches. By placing the cutter links around pipe, screwing down block and moving handle from side to side a pipe may be cut in a very short time.

Any number of links can be attached or detached quickly to fit different sizes of pipe without the use of bolts, pins or tools of any kind.

NOS.	0	1	2	3
Cuts Pipe, Inches	½ to 6	2 to 8	8 to 16	14 to 24
Each	$40.00	50.00	65.00	80.00

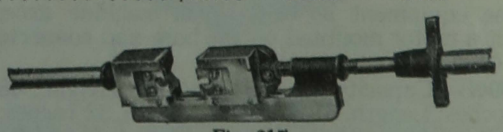

Fig. 217

Cuts pipe off square, leaving no burr. Works on same principle as a lathe tool. Preserves full inside pipe opening. Cannot split pipe, works easier and quicker than a wheel cutter. Automatic feed.

NOS	1	5
Capacity, Inches	⅛ to 1	½ to 2
Weight Each, Lbs.	8	12
Each	$18.00	20.00
Extra Knives, Each	$1.20	1.50

PIPE BENDING MACHINES

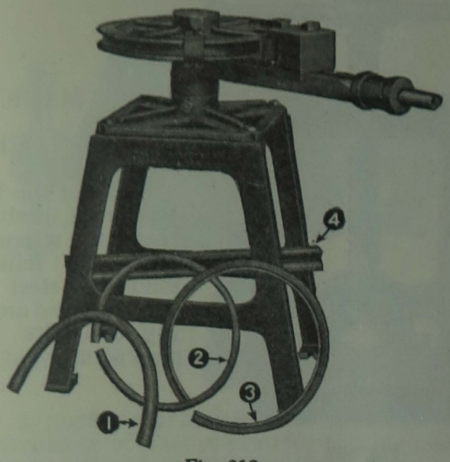

Fig. 218

Especially adapted for bending bars, pipe and special shapes to a radius ranging from 6 to 32 inches diameter of circle. The "V" bar is used in connection with iron pipe bending. It is placed between pipe and roller and follows point of bending, thus holding up the walls of the pipe to prevent flattening. Will bend pipe up to $1\frac{5}{16}$ inches outside diameter.

	Each
NO. 2—With One Forming Die and Stand; Weight Each, 360 Lbs.	$120.00
"V" Bar furnished when ordered at an additional price of	10.00

Extra Forming Dies

Size, Inches	6 to 12	13 to 16
Each	$22.50	26.25
Size, Inches	17 to 20	21 to 24	25 to 30
Each	$30.00	33.75	37.50

When ordering state whether wanted for pipe or bar bending.

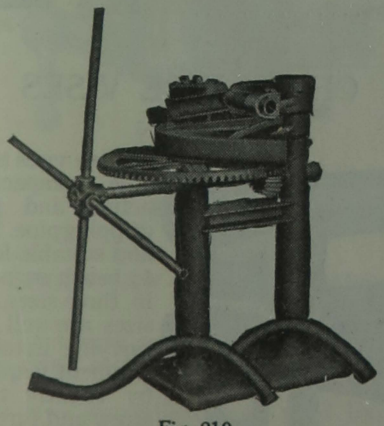

Fig. 219

Has new and improved features. The pipe is not crowded forward by a roller, but is forced into the quadrant or forming die by means of a "V"-shaped rocker bar which supports the wall of pipe at point of bending. Will not disfigure or mar pipe. Steel, iron, brass, and copper pipe may be bent cold up to and including 2 inches in diameter.

	Each
NO. 5A—With Plain Stand and Quadrants for 1 Inch Pipe, Radius 6 Inches; $1\frac{1}{4}$, Radius 9 Inches; $1\frac{1}{2}$, Radius 12 Inches; 2, Radius 14 Inches; Weight Each, 985 Lbs.	$250.00

Special Quadrants Furnished at Extra Cost.

PIPE BENDING FORMS

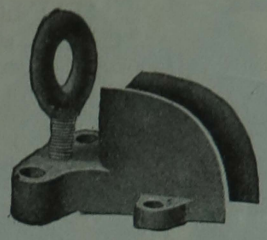

Fig. 220

A handy tool for the pipe bench. Has bolt holes so that it may be attached to bench or other support. Will straighten pipe or make an offset or quarter bend. Made in two sizes with extension bolt eye. When bending light tubes or nickel plated pipe, a piece of sheet lead, rubber or leather placed on form and eye bolt will prevent marring of work.

NOS.	1	2
Takes Pipe, Inches	$\frac{1}{8}$ to $1\frac{1}{4}$	1 to 2
Weight Each, Lbs.	11	21
Each	$3.50	4.50

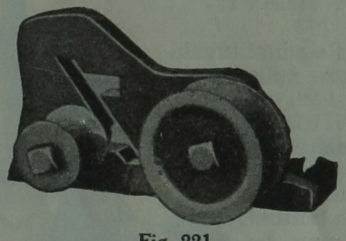

Fig. 221

REX

For use of plumbers, steam and gas fitters, concrete workers and electricians. Can be set for any bend by adjusting spool. May be quickly attached to bench, floor or wall. No. 3 can be bolted to a plank and fastened to studdings or beams where work is done.

NOS.	1	2	3
Pipe Capacity, Inches	$\frac{1}{8}$–$1\frac{1}{4}$	$1\frac{1}{4}$–2	$\frac{1}{8}$–$1\frac{1}{4}$
Weight Each, Lbs.	17	50	20
Each	$6.50	12.00	6.50

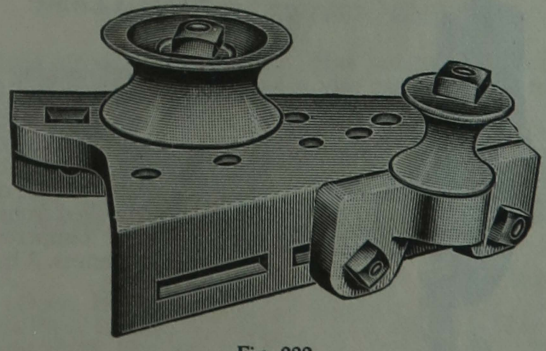

Fig. 222

For bending conduit pipe. Will bend $\frac{1}{2}$ to $1\frac{1}{4}$ pipe into a great variety of shapes. It is strong and durable and quickly set up.

	Each
NO. 3—Weight Each, 15 Pounds	$40.00

PIPE VISES

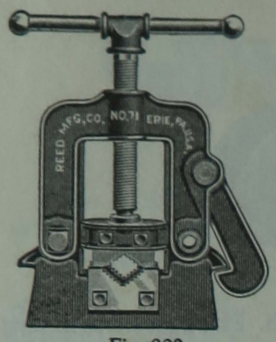

Fig. 223

SELF-LOCKING

Made in standard weight. Hook and upper jaw clamps very strong. Jaws have two bolts instead of the ordinary one. The extension of the base at the back is flat on top so that the heads of the bolts which fasten it to the bench are easily reached. Jaws are milled from solid tool steel bars, carefully hardened and tempered in oil.

NOS.	7000	700	70
Holds Pipe, Inches	⅛ to 1¼	⅛ to 1½	⅛ to 2
Weight Each, Lbs.	3	5	7½
Each	$2.50	3.60	4.25
Extra Jaws, per Set	$1.20	1.40	1.75
NOS.	71	72	73
Holds Pipe, Inches	⅛ to 2½	⅛ to 3½	⅛ to 4½
Weight Each, Lbs.	10	16	25
Each	$5.00	7.50	11.00
Extra Jaws, per Set	$1.75	2.50	3.50

EXTRA HEAVY

Guaranteed against breakage. Jaws are milled from solid tool steel, carefully tempered in oil to give toughness and strength. Base has flat bottom and may be bolted anywhere on a bench, post or wagon bottom. Fastening bolts may be easily reached.

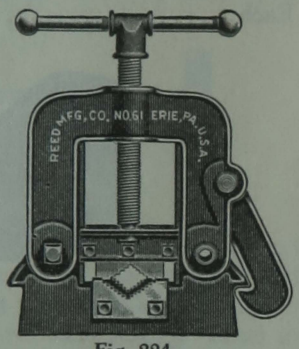

Fig. 224

NOS.	61	62	63
Holds Pipe, Inches	⅛ to 2½	⅛ to 3½	⅛ to 4½
Weight Each, Lbs.	13	20	30
Each	$6.00	9.00	12.50
Extra Jaws, per Set	$1.75	2.50	3.50
NOS.	64	65	66
Holds Pipe, Inches	⅛ to 6	1 to 8	1½ to 12
Weight Each, Lbs.	49	81	163
Each	$23.50	47.50	70.00
Extra Jaws, per Set	$6.00	8.50	13.50

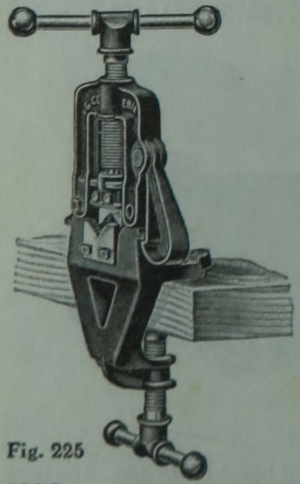

Fig. 225

WITH CLAMP

Standard self-locking pipe vise with added convenience of a base with a clamping device which permits of it being quickly set up at the place the work is to be done. The jaws are milled from tool steel carefully tempered in oil to give toughness. A handy vise for the kit.

NOS.	9000	900	90	91
Holds Pipe, Inches	⅛ to 1¼	⅛ to 1½	⅛ to 2	⅛ to 2½
Weight Each, Lbs.	4½	7½	10	14
Each	$3.50	4.50	5.00	6.50
Extra Jaws, per Set	$1.20	1.40	1.75	1.75

PIPE VISES

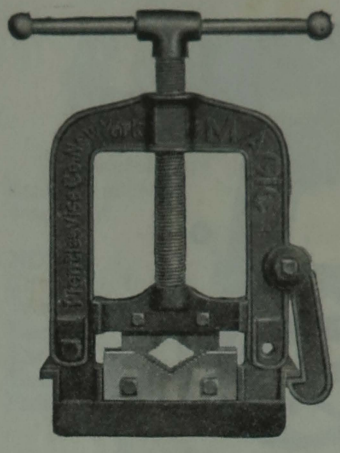

Fig. 226

MAGIC

SELF-LOCKING

Made of the best malleable iron, nicely finished. Has extra strong clamps. Jaws are milled from solid tool steel carefully tempered and are fastened with two bolts. Will hold pipe securely.

NOS.	110	111	112	113	114
Holds Pipe, Ins.	⅛ to 2	⅛ to 2½	⅛ to 3½	¼ to 4½	1 to 6
Weight Ea., Lbs.	4½	9	15	19	36
Each	$3.60	5.00	7.50	11.00	23.50
Extra Jaws, per set	$0.80	1.20	1.60	2.00	3.50

STRAP VISES

For holding all kinds of nickel-plated and polished pipe and tubing without marring. The handle is out of the way and is easily used without regard to the way the vise is faced on the bench. Will accommodate different size pipe without loss of time as no bushings are used. Strap made of specially woven linen web. Rosin, whiting or chalk should be used on strap to prevent its slipping.

	Each
NO. 51—Capacity ⅛ to 2 Inches; Weight Each, 9½ Lbs.	$4.00
Extra Straps	.50

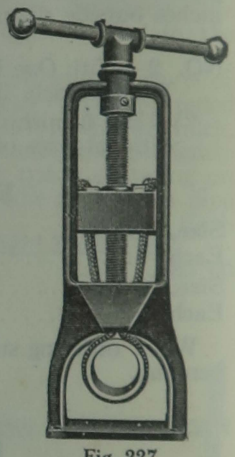

Fig. 227

CHAIN PIPE VISES

VULCAN

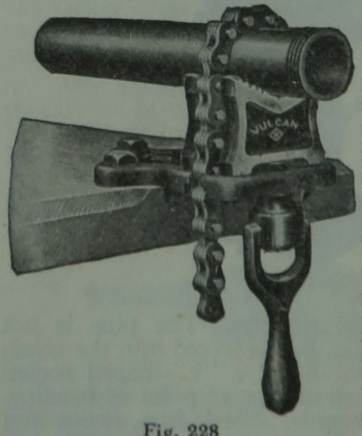

Fig. 228

These vises are unbreakable, compact, rapid in action and positive in gripping pipe. Serviceable, and suitable for fastening to bench or post. Made in three sizes, the smaller sizes are well adapted for carrying in tool bag. Adjustment is quickly made by slightly turning the screw and further adjustment by engaging the projecting rivets of chain with a series of bosses on base. Made entirely of wrought steel; jaws are drop forged of saw tempered steel for file sharpening.

NOS.	1	2	4
Capacity, Inches	⅛ to 2	¼ to 4	¾ to 8
Weight Each, Lbs.	4	10	30
Each	$3.50	7.50	18.00
Extra Jaws, per Pair	$1.50	3.50	9.00
Extra Chain with Screw, Each	$1.25	2.40	6.00

COMBINATION VISES

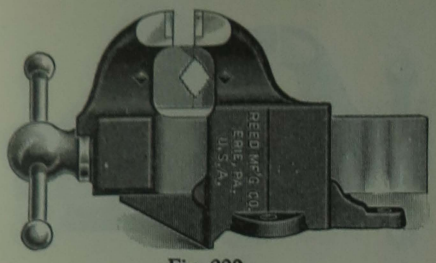

Fig. 229

SOLID JAW—STATIONARY BASE

This is a regular machinists' vise in design with the added convenience of a set of jaws for holding pipe. They were designed after deliberate breaking tests and as a result are unequaled for strength and rigidity. The nut which is a part subject to wear, has a milled base which fits into a milled slot in the body and is very quickly and easily replaced. The nuts and other parts are finished to limit gauges and are strictly interchangeable. All vise jaws have carefully hardened tool steel facings.

NOS.	931	932	933	934
Width Jaws, Inches	3½	4½	5	6
Jaws Open, Inches	4	5	6¼	8¼
Holds Pipe, Inches	⅛ to 2½	⅛ to 3½	⅛ to 4½	⅛ to 6
Weight Each, Lbs.	45	70	115	170
Each	$16.00	22.00	32.00	45.00
Extra Pipe Jaws, per Set of 3	$2.40	3.40	5.60	8.00

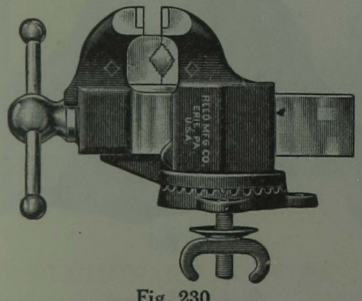

Fig. 230

SOLID JAW—SWIVEL BASE

Designed for severe service requirements, constructed with ample cross section at all points where metal is needed.

The pipe jaws are milled from solid tool steel bars tempered in oil to give toughness and each one is tested. Has improved swivel base with lugs on base plate so it may be securely bolted to the bench instead of being fastened down by wood screws as heretofore. All parts are interchangeable.

NOS.	31	32	33	34
Width Jaws, Inches	3½	4½	5	6
Jaws Open, Inches	4	5	6¼	8¼
Holds Pipe, Inches	⅛ to 2½	⅛ to 3½	⅛ to 4½	⅛ to 6
Weight Each, Lbs.	46	72	119	178
Each	$16.00	22.00	32.00	45.00
Extra Pipe Jaws, per set of 3	$2.40	3.40	5.60	8.00

COMBINATION VISES

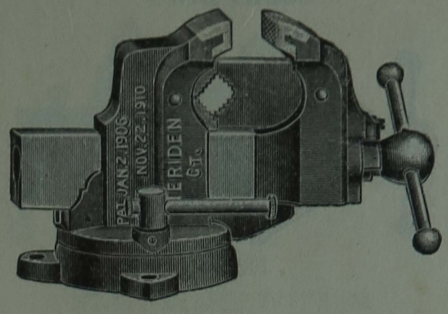

Fig. 231

SUPERIOR
SOLID JAW—SWIVEL BASE

This vise has a solid steel bar slide strengthener which adds greatly to its strength; also patent swivel base with positive locking device adding support and stability over the old style swivel. The pipe jaws are milled from tool steel and are finely tempered by an exclusive process. Has extra strong clean cut thread screws and nuts, saddle and saddle screw. All parts are interchangeable and renewable.

NOS.	87	88	288½	289½
Width Jaws, Inches	3½	4½	5	6
Jaws Open, Inches	3	5	6	9½
Holds Pipe, Inches	2	3	4	6
Weight Each, Lbs.	47	71	118	185
Each	$16.00	22.00	32.00	45.00
Extra Pipe Jaws, Each	$ 2.00	2.50	3.00	4.00

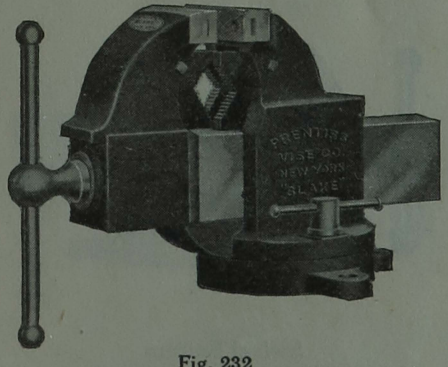

Fig. 232

BLAKE
SOLID JAW—SWIVEL BASE

Made strongly throughout. Has patented detachable steel jaw faces. The user of a vise may thereby secure either rough or smooth jaw facings, exchanging them whenever desired, or faces may be left unhardened so that they may be recessed to hold small pieces for drilling, etc. The manner of attaching these faces to the jaws is such that the facing becomes as solid and immovable as by the old process of welding.

NOS.	180	180½
Jaws Open, Inches	2½	3
Holds Pipe, Inches	⅛ to 1	⅛ to 1½
Weight Each, Lbs.	15	22
Each	$10.00	12.00

NOS.	181	182	182½
Jaws Open, Inches	3½	4¼	5
Holds Pipe, Inches	⅛ to 2½	⅛ to 3	⅛ to 4
Weight Each, Lbs.	55	80	120
Each	$16.00	22.00	32.00

MACHINISTS' VISES
SOLID JAWS

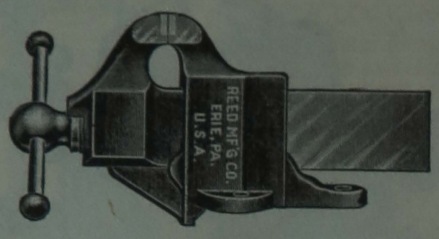

Fig. 233

STATIONARY BOTTOM

High quality; strength and durability. The nuts which are subject to wear have milled bases which fit into milled slots in the bodies; easily and quickly replaced.

NOS.	102	102½	103	103½
Width Jaw, Inches	2	2½	3	3½
Opens, Inches	3	3½	4	5
Weight Each, Lbs.	10½	14½	22	29
Each	**$8.25**	**9.00**	**10.00**	**11.25**

NOS.	104	104½	105	105½
Width Jaw, Inches	4	4½	5	5½
Opens, Inches	6	7	8	9
Weight Each, Lbs.	43	60	73	103
Each	**$12.75**	**15.50**	**20.00**	**30.00**

NOS.	106	107	108	109
Width Jaw, Inches	6	7	8	9
Opens, Inches	10	12	12	13
Weight Each, Lbs.	135	175	236	283
Each	**$39.00**	**55.00**	**75.00**	**90.00**

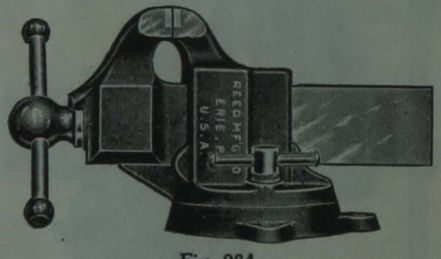

Fig. 234

Swivel Bottom

High quality; strength and durability; clamping bolt head for the swivel base is V-shaped and works in a V-channel. This gives a positive grip. Vises with smooth ground instead of corrugated jaw facings can be furnished without extra charge.

NOS.	202	202½	203	203½
Width Jaw, Inches	2	2½	3	3½
Opens, Inches	3	3½	4	5
Weight Each, Lbs.	12½	20	27	38
Each	**$10.50**	**12.00**	**13.00**	**15.00**

NOS.	204	204½	205	205½
Width Jaw, Inches	4	4½	5	5½
Opens, Inches	6	7	8	9
Weight Each, Lbs.	51	66	89	120
Each	**$17.00**	**20.00**	**30.00**	**38.00**

NOS.	206	207	208	209
Width Jaw, Inches	6	7	8	9
Opens, Inches	10	12	12	13
Weight Each, Lbs.	153	204	278	327
Each	**$52.00**	**70.00**	**98.00**	**115.00**

MACHINISTS' VISES
SWIVEL JAWS

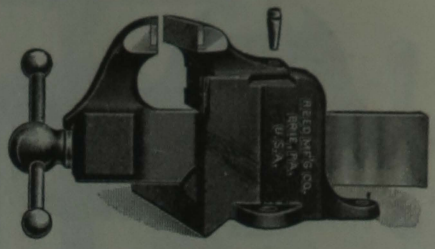

Fig. 235

STATIONARY BOTTOM

High quality; fully guaranteed; will stand up under roughest shop use; easy working; all jaws are steel faced; by removing pin from the back jaw it will swivel so that the jaws will grip firmly any irregularly shaped piece.

NOS.	302	302½	303	303½
Width Jaw, Inches	2	2½	3	3½
Opens, Inches	2½	3	3½	4
Weight Each, Lbs.	11	17	25	35
Each	**$11.50**	**13.50**	**15.00**	**16.00**

NOS.	304	304½	305	305½
Width Jaw, Inches	4	4½	5	5½
Opens, Inches	4¾	5½	6½	7¾
Weight Each, Lbs.	50	66	82	116
Each	**$19.00**	**22.00**	**28.00**	**35.00**

NOS.	306	307	308
Width Jaw, Inches	6	7	8
Open, Inches	9	11½	12
Weight Each, Lbs.	141	196	273
Each	**$50.00**	**65.00**	**90.00**

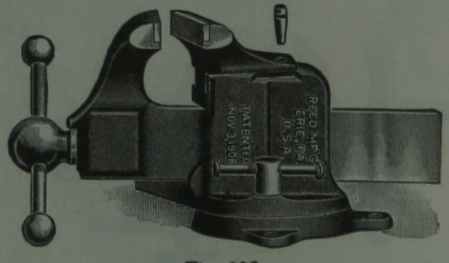

Fig. 236

Swivel Bottom

High quality; free from breakage; easy working; vises with smooth ground steel jaw facings can be furnished without extra charge. Can be adjusted to right or left by turning side bar.

NOS.	402	402½	403
Width Jaw, Inches	2	2½	3
Opens, Inches	2½	3	3½
Weight Each, Lbs.	15	22	31
Each	**$13.50**	**16.00**	**17.50**

NOS.	403½	404	404½	405
Width Jaw, Inches	3½	4	4½	5
Opens, Inches	4	4¾	5½	6½
Weight Each, Lbs.	43	58	72	98
Each	**$20.00**	**24.00**	**28.00**	**35.00**

NOS.	405½	406	407	408
Width Jaw, Inches	5½	6	7	8
Opens, Inches	7¾	9	11½	12
Weight Each, Lbs.	139	164	223	300
Each	**$44.00**	**60.00**	**75.00**	**105.00**

FILERS' VISES

SOLID JAW

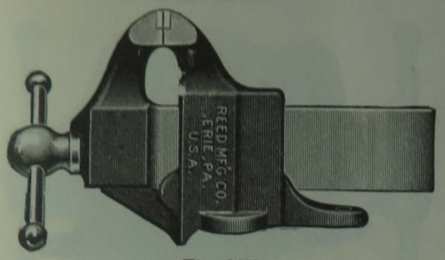

Fig. 237

STATIONARY BOTTOM

High quality; Guaranteed; jaws are high and lean; the throat is deep.

NOS.	114	114½	115
Width Jaw, Inches	4	4½	5
Opens, Inches	5½	6¼	7½
Weight Each, Lbs.	45	56	74
Each	**$14.50**	**16.50**	**20.50**

SWIVEL BOTTOM

Similar to above, but has swivel locking device; rigid screw and nut; quickly replaced.

NOS.	214	214½	215
Width Jaw, Inches	4	4½	5
Opens, Inches	5½	6¼	7½
Weight Each, Lbs.	57	66	93
Each	**$18.00**	**20.00**	**28.00**

SWIVEL JAW

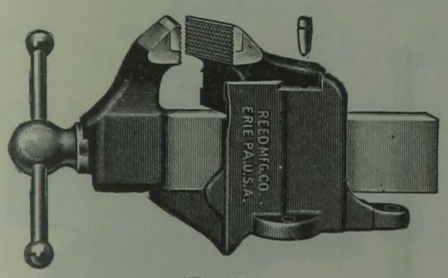

Fig. 238

STATIONARY BOTTOM

High quality, heavy duty vise; strong and rigid; back jaw will swivel by removal of pin.

NOS.	314	314½	315
Width Jaw, Inches	4	4½	5
Opens, Inches	4¾	5½	6¾
Weight Each, Lbs.	48	63	77
Each	**$20.00**	**24.00**	**30.00**

SWIVEL BOTTOM

An ideal tool-room Vise; heavy enough to be used as Chipping Vise. Jaws will adjust themselves to any irregular work. Has high jaws and deep throat; fully guaranteed.

NOS.	414	414½	415
Width Jaw, Inches	4	4½	5
Opens, Inches	4¾	5½	6¾
Weight Each, Lbs.	57	72	98
Each	**$24.00**	**28.00**	**36.00**

COACHMAKERS' VISES

SOLID JAW

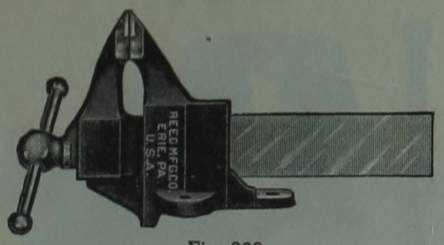

Fig. 239

STATIONARY BOTTOM

High quality; easy working; tool steel jaw facings are left unhardened unless otherwise ordered.

NOS.	124	124½
Width Jaw, Inches	4	4½
Opens, Inches	7	11
Weight Each, Lbs.	46	63
Each	**$15.00**	**17.50**

SWIVEL BOTTOM

Fitted with regular swivel bottom device. Strong and Rigid. Faces of Jaws unusually deep; faces with unhardened tool steel, unless otherwise ordered.

NOS.	224	224½
Width Jaw, Inches	4	4½
Opens, Inches	7	11
Weight Each, Lbs.	54	78
Each	**$20.00**	**22.50**

SWIVEL JAW

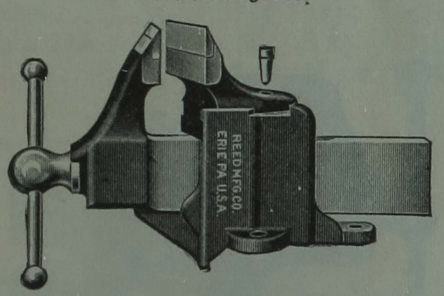

Fig. 240

STATIONARY BOTTOM

Highest quality; high, lean jaws; guaranteed against breakage; jaws will adjust themselves to irregular work. Unhardened tool steel jaw faces furnished unless otherwise ordered.

NOS.	324	324½
Width Jaw, Inches	4	4½
Opens, Inches	6¼	10
Weight Each, Lbs.	51	71
Each	**$21.00**	**25.00**

SWIVEL BOTTOM

An ideal coachmakers' vise; strong, rigid and durable. Will swing at any angle with work bench.

NOS.	424	424½
Width Jaw, Inches	4	4½
Opens, Inches	6¼	10
Weight Each, Lbs.	59	78
Each	**$25.00**	**30.00**

MACHINISTS' VISES

Swivel Jaw

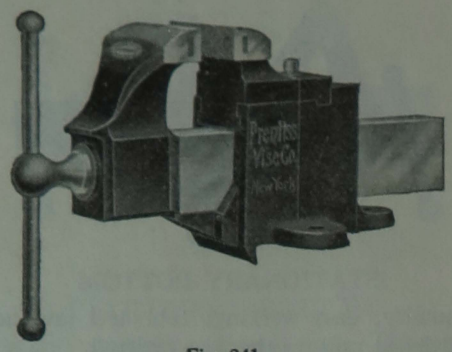

Fig. 241

STATIONARY BOTTOM

High quality, strength and durability. Back jaw automatically adjusts itself to any shaped object. With pin inserted it becomes a solid jaw vise, strong and durable. Jaws faced with tool steel; facings removable. Rough, smooth or unhardened faces supplied if desired.

Swivel Bottom permits instant adjustment Right or Left by means of Ratchet Pin. Solid and firm at any angle.

NOS	1	2	2½
Width Jaw, Inches	2⅝	3½	4
Opens, Inches	3½	4¾	5¼
Weight Each, Lbs.	13½	28	41
Each	**$13.50**	**16.00**	**19.00**

NOS	3	4	5	6
Width Jaw, Inches	4½	5¼	6	7
Opens, Inches	6	8	9	11
Weight Each, Lbs.	54	96	146	184
Each	**$22.00**	**35.00**	**50.00**	**65.00**

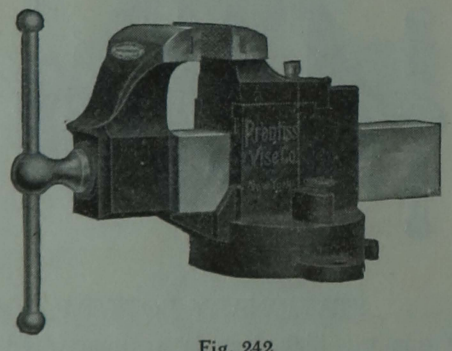

Fig. 242

SWIVEL BOTTOM

Back jaw automatically adjusts itself to any shaped object. With pin inserted it becomes a solid jaw vise, strong and durable; jaws faced with tool steel; facings removable. Rough, smooth or unhardened faces supplied if desired.

Swivel Bottom permits instant adjustment Right or Left by means of Ratchet Pin. Solid and firm at any angle.

NOS	18	19	19½
Width Jaw, Inches	2⅝	3½	4
Opens, Inches	3½	4¾	5¼
Weight Each, Lbs.	17	32	46
Each	**$16.00**	**20.00**	**24.00**

NOS	20	21	22	23
Width Jaw, Inches	4½	5¼	6	7
Opens, Inches	6	8	9	11
Weight Each, Lbs.	65	109	168	207
Each	**$28.00**	**44.00**	**60.00**	**75.00**

MACHINISTS' VISES

Solid Jaw

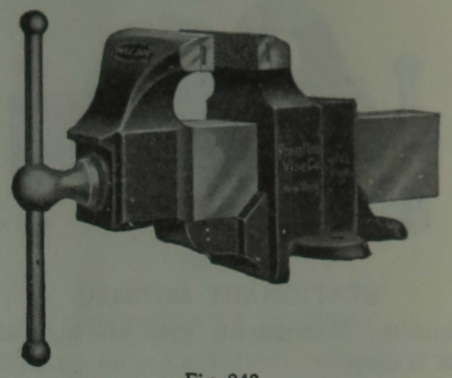

Fig. 243

STATIONARY BOTTOM

Made of selected material; combines strength and durability; supplied with detachable steel jaws; maximum holding power with moderate pressure on work; rough. smooth or unhardened faces supplied as desired.

Swivel bottom permits instant adjustment Right or Left by turning side bar. Solid and firm at any angle.

NOS	50	51	52	53
Width Jaw, Inches	3¼	3⅝	4⅛	4⅝
Opens, Inches	4	5½	6	7
Weight Each, Lbs.	22	28	42	52
Each	**$10.00**	**11.25**	**12.75**	**15.50**

NOS	54	55	56	57
Width Jaw, Inches	5	5½	6	7
Opens, Inches	8	9	10	12
Weight Each, Lbs.	72	100	135	210
Each	**$20.00**	**30.00**	**39.00**	**55.00**

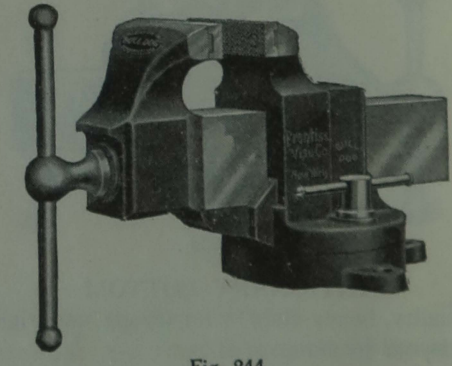

Fig. 244

SWIVEL BOTTOM

Combines strength and durability; supplied with detachable steel jaws; maximum holding power with moderate pressure on work; rough, smooth or unhardened faces supplied as desired.

Swivel Bottom permits instant adjustment Right or Left by turning side bar. Solid and firm at any angle.

NOS	90	91	92	93
Width, Jaw, Inches	3¼	3⅝	4⅛	4⅝
Opens, Inches	4	5½	6	7
Weight Each, Lbs.	28	36	52	64
Each	**$13.00**	**15.00**	**17.00**	**20.00**

NOS	94	95	96	97
Width Jaw, Inches	5	5½	6	7
Opens, Inches	8	9	10	12
Weight Each, Lbs.	85	115	155	235
Each	**$30.00**	**38.00**	**52.00**	**70.00**

MACHINISTS' VISES
RAPID TRANSIT

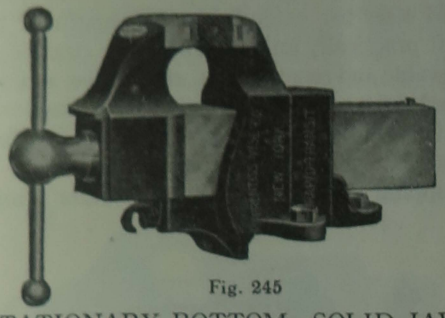

Fig. 245

STATIONARY BOTTOM—SOLID JAW

Simplicity, strength and durability. Limited number of parts; full nut; positive action; vise may be opened and closed full length, by a single movement; the nut will engage screw at any point.

NOS.	Width Jaws, Inches	Jaws Open, Inches	Weight Each, Lbs.	Each
70	3	3½	22	$12.00
71	3¾	4½	33	14.00
72	4¼	5½	54	20.00
73	4¾	6½	65	24.00
74	5½	8	98	34.00
75	6½	9½	150	50.00

SWIVEL BOTTOM ATTACHMENT FOR RAPID TRANSIT VISE

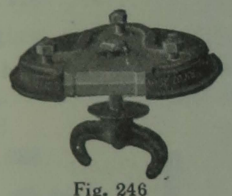

Fig. 246

For Vise NOS.	70	71	72-73	74	75
Each	$1.75	2.25	2.50	3.50	5.00

TOOL MAKERS' AND METAL WORKERS' VISES
UNIVERSAL

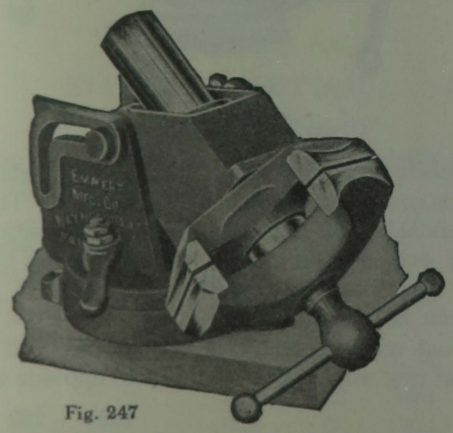

Fig. 247

For every variety of work in tool room, pattern shop, machine shop and for repair and construction work. Provided with five jaws; one pair for filing and fitting, one for round or finish work; one for rings, segments, hollow parts and irregular shapes; one for tapers round or square, etc. Three of the jaws are shaped on vise head any pair of which may be brought into service singly or together in pairs.

NOS.	Width Jaws, Inches	Jaws Open, Inches	Weight Each, Lbs.	Each
4A	4	6	100	$25.00
6A	3	5	55	20.00

MACHINISTS' VISES
VELOX

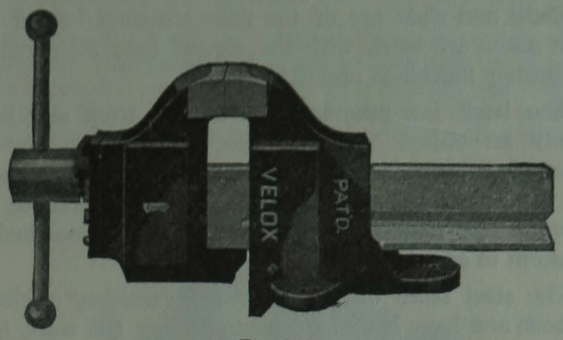

Fig. 248

STATIONARY BOTTOM—SOLID JAW

A substitute for the ordinary bench vise in which the jaws are opened and closed by means of a screw and nut. Has high speed, as the bar can be moved back and forth without operating screws by simply raising front jaw. When the work is in place the front jaw is pushed against it and the lever given a quarter turn which securely clamps the work. Lever is used only for tightening and loosening. No time is lost in adjusting the jaws for different size work. Made with unbreakable solid steel bar. As the bar is narrow ample clearance in throat for deep work is provided. Furnished with cast steel jaw faces.

NOS.	A2½	A3	A3½	A4
Width Jaw, Inches	2½	3	3½	4
Opens, Inches	4	5	5½	6½
Weight Each, Lbs.	17	22	30	45
Each	$9.90	11.00	12.40	14.05

NOS.	A4½	A5	A5½	A6
Width Jaw, Inches	4½	5	5½	6
Opens, Inches	7½	8½	9½	10½
Weight Each, Lbs.	58	80	115	135
Each	$17.05	22.00	33.00	42.90

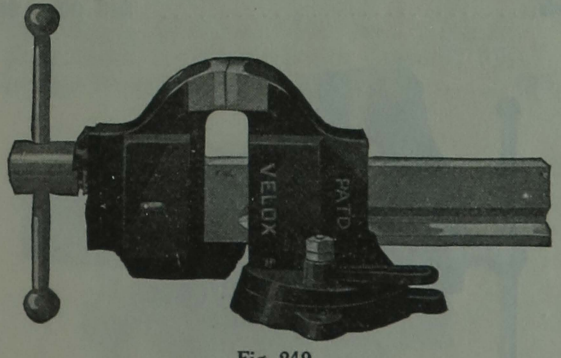

Fig. 249

SWIVEL BOTTOM—SOLID JAW

Similar to above vise, but is provided with swivel bottom which permits adjustment of work to any angle.

NOS.	B2½	B3	B3½	B4
Width Jaw, Inches	2½	3	3½	4
Opens, Inches	4	5	5½	6½
Weight Each, Lbs.	20	30	40	52
Each	$13.20	14.30	16.50	18.70

NOS.	B4½	B5	B5½	B6
Width Jaw, Inches	4½	5	5½	6
Opens, Inches	7½	8½	9½	10½
Weight Each, Lbs.	68	90	125	155
Each	$22.00	33.00	41.00	57.20

COACHMAKERS' VISES

SWIVEL BACK JAWS

Body and slide are of the finest castings; collar and vise screw are steel, with the thread cut; all parts are accurately machined and fitted.

The back jaw automatically adjusts itself and holds firmly an object of any shape. With back jaw pin inserted, it becomes a parallel solid jaw vise. The design of the adjustable back jaw is such that strength and firmness are maintained even when jaw is loosened to conform to angular work.

The steel faces of the jaws are furnished perfectly smooth and have large surfaces to protect the work from injury.

The deep free space between the jaws and the bar makes it possible to hold firmly pieces of great width.

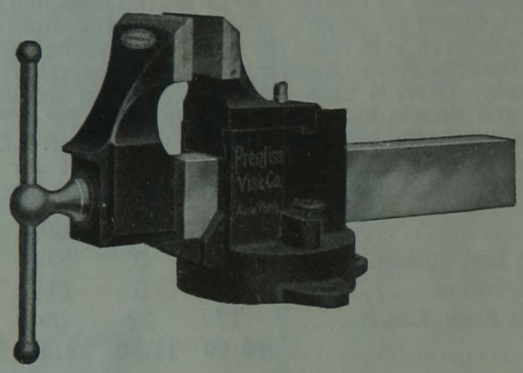

Fig. 250

STATIONARY BOTTOM

NOS	12	10
Width Jaws, Inches	3½	4½
Opens, Inches	7	9½
Weight Each, Lbs	30	59
Each	**$19.00**	**25.00**

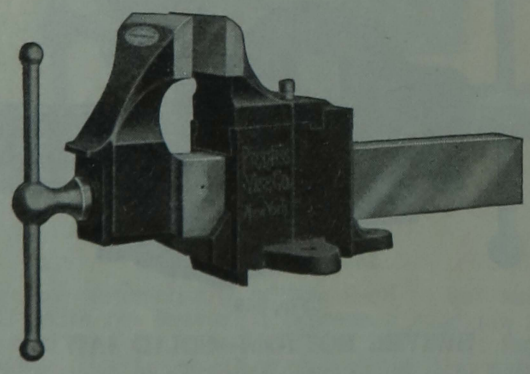

Fig. 251

SWIVEL BOTTOM

The patent swivel bottom enables the operator to instantly adjust the vise to right or left at will, by means of ratchet pin on side of vise, rendering it solid and firm at any desired angle.

NOS	27	26
Width Jaws, Inches	3½	4½
Opens, Inches	7	9½
Weight Each, Lbs	34	67
Each	**$23.00**	**30.00**

MACHINISTS' VISES

NEVERBREAK

A solid steel bar extends the full length of the slide, making it practically unbreakable. The crucible steel jaws are removable and renewable at will. Collar and vise screw are turned from one piece of high carbon steel. Body of the vise is semi-steel, much stronger than the finest grey iron castings. A tension spring prevents lever in screw from dropping down and pinching operator's fingers.

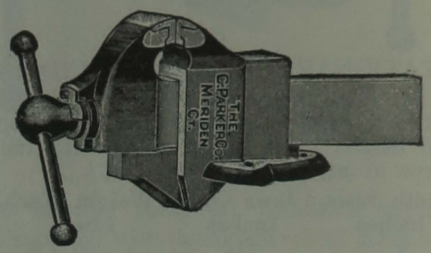

Fig. 252

STATIONARY BOTTOM

NOS	29	39	49
Width Jaw, Inches	3¼	3¾	4¼
Opens, Inches	4	6¼	7
Weight Each, Lbs	31	47	66
Each	**$11.50**	**13.00**	**17.00**

NOS	59	69	79
Width Jaw, Inches	4¾	5¼	6¼
Opens, Inches	8	9	9½
Weight Each, Lbs	81	123	150
Each	**$22.00**	**30.00**	**45.00**

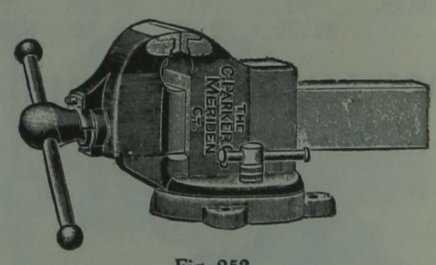

Fig. 253

SWIVEL BOTTOM

A specially designed expansion ring with wedge-shaped opening is contained in groove in swivel base. Tightening the T-handled screw to lock vise in desired position draws a wedge shaped lock into the similar opening in the expansion ring, thereby securely holding vise in position. Swivel can be operated from either side of the vise by turning out centre bolt, lifting vise off base and turning expansion ring with the wedged lock to opposite side.

NOS	229	239	249
Width Jaw, Inches	3¼	3¾	4¼
Opens, Inches	4	6¼	7
Weight Each, Lbs	36	54	75
Each	**$13.50**	**17.00**	**21.00**

NOS	259	269	279
Width Jaw, Inches	4¾	5½	6¼
Opens, Inches	8	9	9½
Weight Each, Lbs	95	143	185
Each	**$27.50**	**38.50**	**55.00**

MACHINISTS' VISES

A solid steel bar extends the full length of the slide, making it practically unbreakable. The crucible steel jaws are removable and renewable at will. Collar and vise screws are turned from one piece of high carbon steel. Body of the vise is of semi-steel, much stronger than the finest grey iron castings. A specially designed expansion ring with wedge-shaped opening is contained in groove in swivel base. Tightening the T-handled screw to lock vise in desired position draws a wedge-shaped lock into the similar opening in the expansion ring, thereby securely holding vise. Swivel can be operated from either side of the vise by turning out centre bolt, lifting vise off base and turning expansion ring with the wedged lock to opposite side; a tension spring prevents lever in screw from dropping down and pinching operators' fingers.

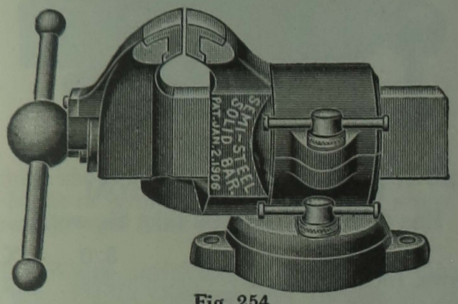

Fig. 254

DOUBLE SWIVEL BOTTOM

With Solid Jaw

Both swivels can be operated independently of each other and of the screw.

NOS	429	439	449
Width Jaws, Inches	3½	4	4½
Jaws Open, Inches	3½	6	7½
Depth Opening, Inches	2⅜	2½	3
Weight Each, Lbs	47	67	87
Each	**$27.00**	**32.00**	**39.00**

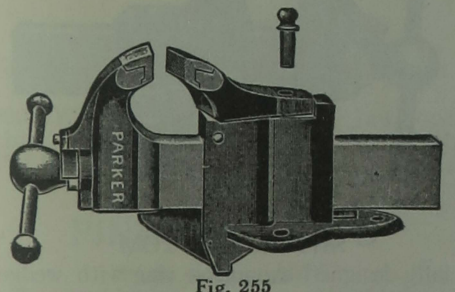

Fig. 255

STATIONARY BOTTOM

With Self-adjusting Back Jaw

Will grip firmly irregularly shaped pieces; back jaw will swivel by removal of pin.

NOS	370	371	371½
Width Jaws, Inches	3	3½	4
Jaws Open, Inches	3½	5	5
Depth Opening, Inches	3⅛	3½	3⅝
Weight Each, Lbs	25	40	41
Each	**$15.00**	**16.00**	**19.00**

NOS	372	373	374	375
Width Jaws, Inches	4½	5	5½	6
Jaws Open, Inches	6	7	9	9½
Depth Opening, Inches	3⅞	4⅛	4½	5
Weight Each, Lbs	59	73	99	149
Each	**$22.00**	**28.00**	**35.00**	**50.00**

HEAVY DUTY VISE

	Each
NO. 340—Similar to Above; Width Jaws, 7 Inches; Jaws Open, 11 Inches; Depth Opening, 5½ Inches; Weight Each, 189 Lbs	$65.00

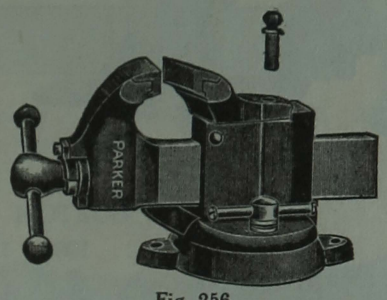

Fig. 256

SWIVEL BOTTOM

With Self-adjusting Back Jaw

NOS	270	271	271½
Width Jaws, Inches	3	3½	4
Jaws Open, Inches	3½	5	5
Depth Opening, Inches	3⅛	3½	3⅝
Weight Each, Lbs	33	51	52
Each	**$17.50**	**20.00**	**24.00**

NOS	272	273	274	275
Width Jaws, Inches	4½	5	5½	6
Jaws Open, Inches	6	7	9	9½
Depth Opening, Inches	3⅞	4⅛	4½	5
Weight Each, Lbs	70½	85	123	174
Each	**$28.00**	**35.00**	**44.00**	**60.00**

HEAVY DUTY VISE

	Each
NO. 240—Similar to Above; Width Jaws, 7 Inches; Jaws Open, 11 Inches; Depth Opening, 5½ Inches; Weight Each, 222 Lbs	$75.00

ANVIL VISES

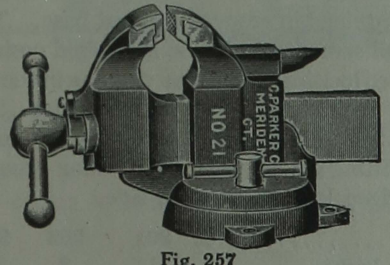

Fig. 257

SWIVEL BOTTOM

With Solid Jaw

Nos. 19 and 20 have faces cast to the jaws; Nos. 21 and 22 have renewable jaw faces.

NOS	19	20	21	22
Width Jaws, Inches	2	2½	3	3½
Jaws Open, Inches	1¾	1¾	3½	4
Depth Opening, Inches	2⅛	2⅛	3¼	3⅝
Weight Each, Lbs	8½	9	28	43
Each	**$9.50**	**11.00**	**14.00**	**16.00**

MACHINISTS' VISES

ECLIPSE—SOLID JAW

Light construction. The crucible steel jaws are removable and renewable at will; collar and vise screw are turned from one piece of high carbon steel. Body of the vise is of gray iron.

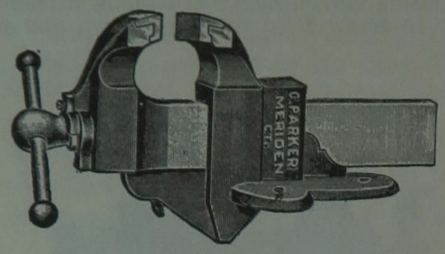

Fig. 258

STATIONARY BOTTOM

NOS.	102	103	104
Width Jaws, Inches	3	3½	4
Jaws Open, Inches	4½	5½	6½
Depth Opening, Inches	3¼	3⅝	3¾
Weight Each, Lbs.	22	35	43
Each	**$10.00**	**11.25**	**12.75**

NOS.	105	106	106½	107
Width Jaws, Inches	4½	5	5½	6
Jaws Open, Inches	7	8	9	10½
Depth Opening, Inches	4¼	4¾	5⅛	5½
Weight Each, Lbs.	61	83	105	132
Each	**$15.50**	**20.00**	**30.00**	**39.00**

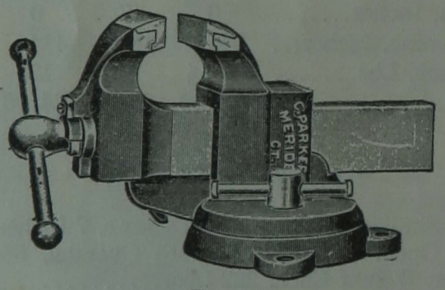

Fig. 259

SWIVEL BOTTOM

Specially designed expansion ring with wedge-shaped opening is contained in groove in swivel base. Tightening the T-handled screw to lock vise in desired position draws a wedge-shaped lock into the similar opening in the expansion ring, thereby securely holding vise in position. Swivel can be operated from either side of the vise by turning out centre bolt, lifting vise off base and turning expansion ring with the wedged lock to opposite side.

NOS.	201	202	203	204
Width Jaws, Inches	2½	3	3½	4
Jaws Open, Inches	3½	4½	5½	6½
Depth Opening, Inches	3	3¼	3⅝	3¾
Weight Each, Lbs.	16½	25	41	57
Each	**$12.00**	**13.00**	**15.00**	**17.00**

NOS.	205	206	206½	207
Width Jaws, Inches	4½	5	5½	6
Jaws Open, Inches	7	8	9	10½
Depth Opening, Inches	4¼	4¾	5⅛	5½
Weight Each, Lbs.	75	104	125	157
Each	**$20.00**	**30.00**	**38.00**	**52.00**

MACHINISTS' VISES

STYLE X—SOLID JAW

The crucible steel jaws are removable and renewable at will; collar and vise screw are turned from one piece of high carbon steel. Body of the vise is a semi-steel much stronger than the finest gray iron castings.

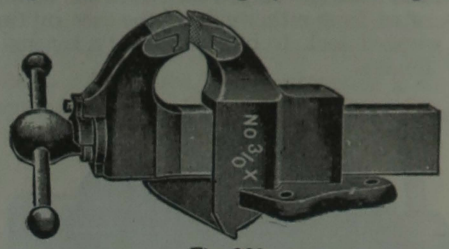

Fig. 260

STATIONARY BOTTOM

Has deep jaws and will take big work.

NOS.	3/0	1X	2X
Width Jaws, Inches	3¼	3¾	4¼
Jaws Open, Inches	4	5	6½
Depth Opening, Inches	3¼	3⅝	3⅞
Weight Each, Lbs.	28	46	61
Each	**$11.50**	**13.00**	**17.00**

NOS.	3X	4X	5X
Width Jaws, Inches	4¾	5½	6¼
Jaws Open, Inches	8	9½	9½
Depth Opening, Inches	4⅜	4¾	5⅜
Weight Each, Lbs.	75	112	152
Each	**$22.00**	**30.00**	**45.00**

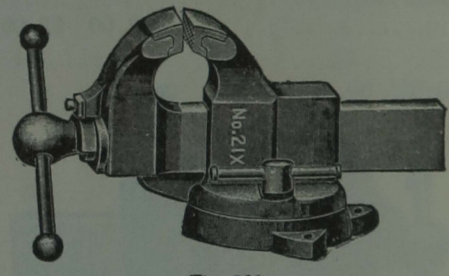

Fig. 261

SWIVEL BOTTOM

A specially designed expansion ring with wedge-shaped opening is contained in groove in swivel base. Tightening the T-handled screw to lock vise in desired position draws a wedge-shaped lock into the similar opening in the expansion ring, thereby securely holding vise in position. Swivel can be operated from either side of the vise by turning out centre bolt, lifting vise off base and turning expansion ring with the wedged lock to opposite side.

NOS.	21X	22X	23X
Width Jaws, Inches	3¼	3¾	4¼
Jaws Open, Inches	4	5	6½
Depth Opening, Inches	3¼	3⅝	3⅞
Weight Each, Lbs.	33	54	74
Each	**$13.50**	**17.00**	**21.00**

NOS.	24X	25X	26X
Width Jaws, Inches	4¾	5½	6¼
Jaws Open, Inches	8	9½	9½
Depth Opening, Inches	4⅜	4¾	5⅜
Weight Each, Lbs.	89	135	180
Each	**$27.50**	**38.50**	**55.00**

HEAVY DUTY VISE

Same construction as other style X vises; solid jaw and stationary bottom; built for extra heavy work.

Each

NO. 5½X—Width Jaw, 7 Inches; Jaws Open, 10½ Inches; Depth Opening, 5⅜ Inches; Weight Each, 187 Lbs. $55.00

RAILWAY VISES

SOLID JAW

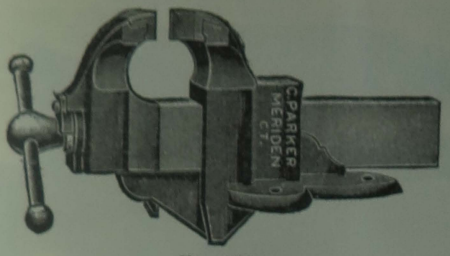

Fig. 262

STATIONARY BOTTOM

These vises are especially adapted for use in railroad and machine shops, yards and factories where the work is heavy. Made of semi-steel with improved screw and nut and renewable steel faces of large size.

	Each
NO. 60—Width Jaws, 8⅛ Inches; Jaws Open 13¾ Inches; Depth Opening, 6¾ Inches; Weight Each, 245 Lbs.	$95.00

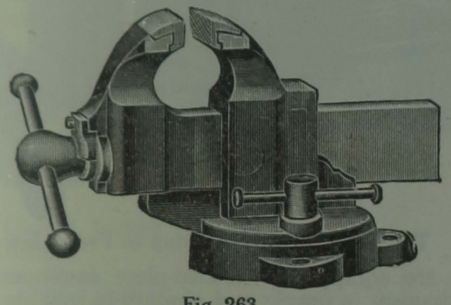

Fig. 263

SWIVEL BOTTOM

Similar to No. 60 but with swivel bottom.

	Each
NO. 260—Width Jaws, 8⅛ Inches; Jaws open 13¾ Inches; Depth Opening, 6¾ Inches; Weight Each, 285 Lbs.	$105.00

FINISHING CAPS

FOR VISE JAWS

Brass and Copper

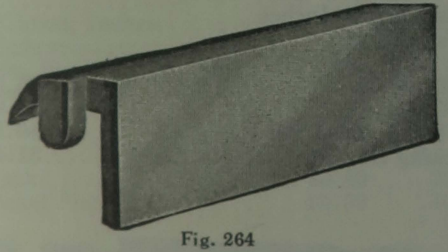

Fig. 264

These caps are made to be used over rough jaw faces, so that the ordinary face of the jaws will not injure finished work that may be clamped in the vise. When ordering state size of jaws and number of vise. Made of either brass or copper.

Length of Caps to fit Vise Jaws. Inches	Per Pair Brass	Copper
2, 2⅛, 2¼, 2⅝	$0.95	$1.10
3, 3⅛, 3¼	1.10	1.20
3½, 3⅝, 3¾	1.20	1.50
4, 4⅛, 4¼	1.35	1.60
4½, 4⅝, 4¾	1.90	2.15
5, 5¼, 5⅜	2.00	2.65
....5½	2.70	3.50
6, 6⅛, 6¼	3.15	4.00
....6½	3.65	4.65

HAND VISES

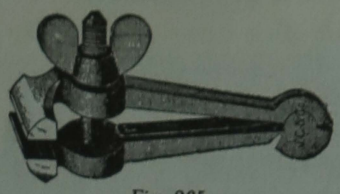

Fig. 265

Made of best cast steel; jaws and screws hardened; finished black or polished.

NO. 747

Length, Inches	2¾	3¼	3¾	4½
Weight per Dozen, Lbs.	...	...	...	...
Per Dozen $	...	...	...	...

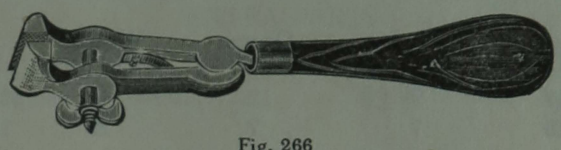

Fig. 266

Made of best steel; finished black, polished, or polished and plated with black wood handle.

NO. 748

Length, Inches	2¾	3¼	3¾
Weight per Dozen, Lbs.	...	...	...
Per Dozen $	...	...	...

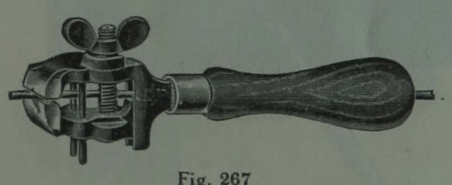

Fig. 267

Hardened steel jaws; carbon finish; polished round rosewood handle.

	Per Dozen
NO. 60—Jaws, 1¼ Inches Wide; Open, ¾ Inch.	$16.00

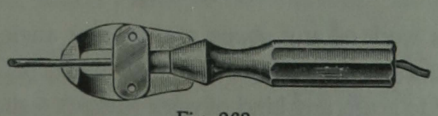

Fig. 268

Hardened steel jaws, carbon finish; octogan handle which can be clamped in a vise.

	Per Dozen
NO. 50—Holds 3/16 Inch and Smaller	$18.00

PIN VISES

Fig. 269

Hardened steel jaws with chucks that take hold firmly. Nickel plated.

NOS.	162A	162B	162C	162D
Cap., Inch.	0 to .040	.030 to .062	.050 to .125	.115 to .187
Each	$0.70	.70	.70	.90

WOODWORKERS' VISES

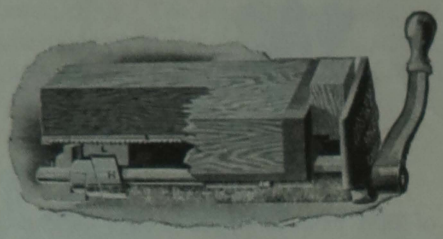

Fig. 270

LIGHTNING GRIP

Operates easily and rapidly. A slide adjustment of the full range of the vise is possible, but a quarter turn of the handle at any desired opening gives a tight positive grip.

NOS.	Width Jaw, Inches	Opens, Inches	Weight Each, Lbs.	Each
17	9	12	47	$12.00
19	7	7	29	10.00

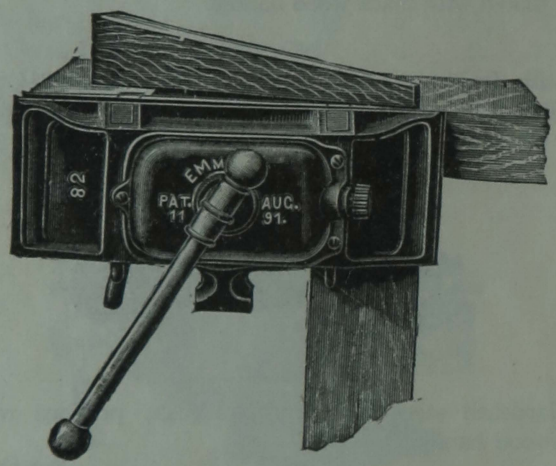

Fig. 271

UNIVERSAL

Holds work of any shape and at any angle above or below the bench. Furnished with seven pairs of Jaws, adapted to grasp any kind of work without regard to irregularity and form. Can be swung into any position to suit convenience of workman. Any pair of the Jaws may be adjusted instantly. Main Jaws when vertical hold broad flat pieces above level of bench base. One pair of Jaws is provided with button-hole openings into which wood pads of any shape may be placed and fastened; has also small square groove into which may be placed and locked the adjustable Jaw, self-accommodating to taper and other irregular work. Angle of Jaw may be changed by fastening wedge-shaped piece of wood to it, or by lining face of Jaw with wooden forms to suit work.

NOS.	Width Jaws, Inches	Jaws Open, Inches	Weight, Each, Lbs.	Each
1	7x18½	14	86	$25.00
2	5x14	12	56	22.50

WOODWORKERS' VISES

RAPID ACTING

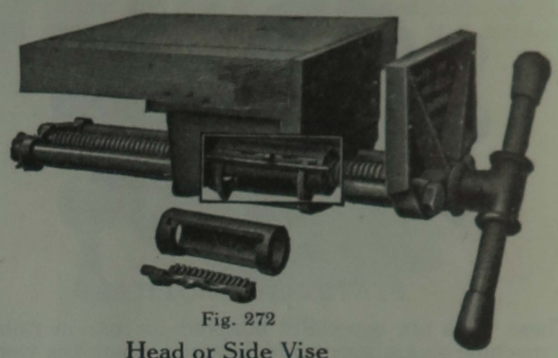

Fig. 272

Head or Side Vise

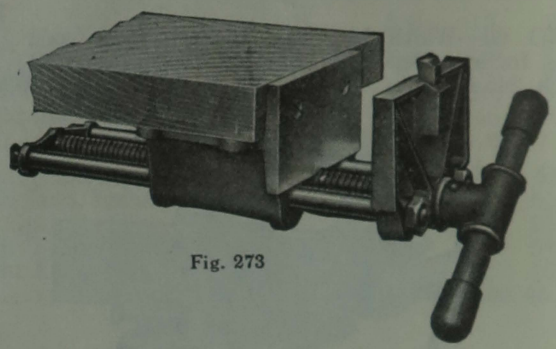

Fig. 273

Tail Vise with Brass Stop in Front Jaw

Vises are equipped with two-piece cam-operated nut. Its mechanism is simple and absolutely reliable in operation. Has no small parts to wear out. The nut proper is phosphor bronze. The nut sleeve is gray iron. Instantaneous adjustments; continuous in operation. Operates entire length of screw. Nut released and disengaged by slight reverse movement on handle. When pressure is applied nut engages and locks screw firmly. Guides are of cold rolled steel. Jaws of gray iron; faces ground and finished. Can be made to order to open any length. Maple faces for jaws can be furnished.

SIZE NOS.	1	2
Width Jaws, Inches	7	10
Depth Jaws, Inches	4	5
Opens, Inches	10	12
Diameter Screw, Inches	1	1
Threads per Inch	4	4
Weight Each, Lbs.	32	42
NO. 430—Each	$6.00	7.20
NO. 430S—Each	$6.60	7.80
Maple-faced Jaws, Per Pair	$0.50	.50
Nut-locking Device Complete, Each	$1.50	1.50

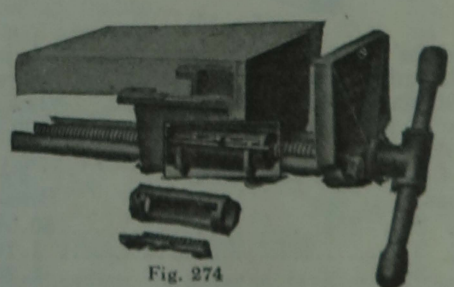

Fig. 274

For Very Light Work

	Each
NO. 530—Jaws 3½ Inches Wide; 2 Inches Deep; 5-Inch Opening; Handle 5½ Inches Long; Screw ½ Inch Diameter; Weight Each, 3¾ Lbs.	$3.50

WRENCHES
ADJUSTABLE

Made from selected open hearth steel, drop forged and perfectly tempered. Upper jaw and bar are forged in one piece adjusted by knurled screw. Threads on bar and in nut are accurately milled and cut thereby, preventing the wrench from binding when in use. Made either in Black or Nickel Finish.

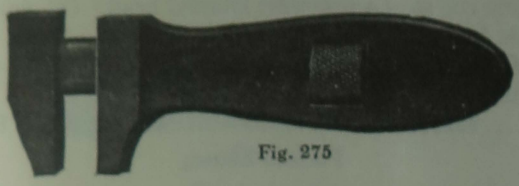

Fig. 275

NO.	B
Length, Closed, Inches	3
Opens, Inches	1
Per Dozen, Black	$14.40
Per Dozen, Nickel Plated	$16.80

EXTRA PARTS

	Handle	Bar	Nut
Each, Black	$0.40	.35	.10
Each, Nickel Plated	$0.45	.40	.10

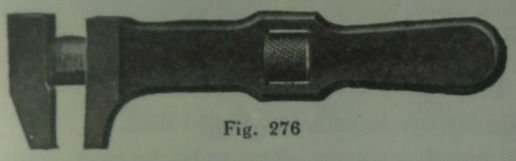

Fig. 276

NO.	B
Length, Closed, Inches	5
Opens, Inches	1
Per Dozen, Black	$ 9.00
Per Dozen, Nickel Plated	$10.00

EXTRA PARTS

	Handle	Bar	Nut
Each, Black	$0.40	.35	.10
Each, Nickel Plated	$0.45	.40	.10

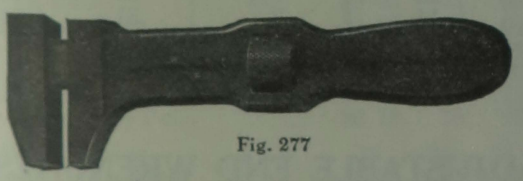

Fig. 277

NO.	D
Length, Closed, Inches	6
Opens, Inches	1¼
Per Dozen, Black	$10.00
Per Dozen, Nickel Plated	$12.00

EXTRA PARTS

	Handle	Bar	Nut
Each, Black	$0.40	.35	.10
Each, Nickel Plated	$0.50	.40	.10

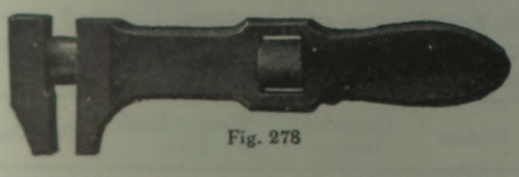

Fig. 278

NO.	E
Length, Closed, Inches	7
Opens, Inches	1¾
Per Dozen, Black	$12.00
Per Dozen, Nickel Plated	$15.00

EXTRA PARTS

	Handle	Bar	Nut
Each, Black	$0.50	.40	.10
Each, Nickel Plated	$0.65	.50	.10

All Above, One in a Cardboard Box.

WRENCHES
ADJUSTABLE

Made from selected open hearth steel, drop forged and perfectly tempered. Threads on bar and nut are accurately milled and cut.

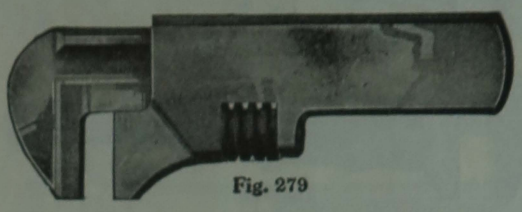

Fig. 279

NO.	97
Length, Closed, Inches	4¼
Opens, Inches	1⅞
Per Dozen, Mottled Finish	$9.60
Per Dozen, Nickel Plated	$12.00

EXTRA PARTS

	Handle	Bar	Nut
Each, Black	$0.27	.18	.10
Each, Nickel Plated	$0.35	.22	.10

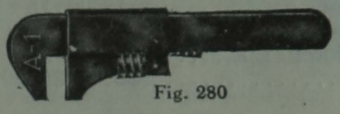

Fig. 280

NOS.	A1	A2
Length Over All, Inches	5	5½
Opens, Inches	1¼	1⅝
Each, Mottled Finish	$0.28	$0.36
Each, Nickel Plated	$0.35	.50

Twelve in a Cardboard Box.

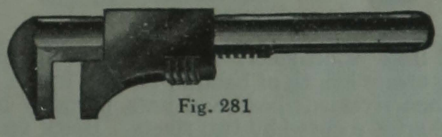

Fig. 281

AUTOMOBILE

NOS.	1	2	3
Length, Closed, Inches	6	8	10
Opens, Inches	1 11/16	1 7/16	2 7/16
Per Dozen, Semi-finished	$ 7.00	$ 9.00	$10.00
Per Dozen, Full Finished	$ 8.00	10.00	12.00
Per Dozen, Nickel Plated	$10.00	12.00	16.00
NOS.	**4**	**5**	**6**
Length, Closed, Inches	12	14	18
Opens, Inches	2¾	2 13/16	3 3/16
Per Dozen, Semi-finished	$15.00	$20.00	$28.00
Per Dozen, Full Finished	$18.00	24.00	34.00
Per Dozen, Nickel Plated	$24.00	.....	.....

One in a Cardboard Box.

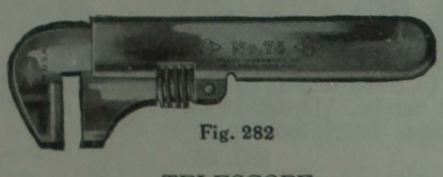

Fig. 282

TELESCOPE

Cast steel; case hardened jaws; front jaw and bar one piece, fitting into hollow handle.

NO.	76
Length Closed, Inches	6
Opens, Inches	8
Each, Mottled Finish	$1.20
Each, Nickel Finish	$1.40

One in a Box.

WRENCHES

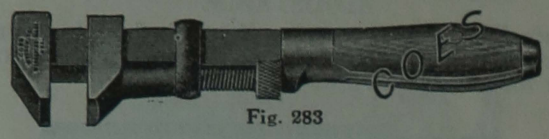

Fig. 283

Knife Handle

Fig. 284

Steel Handle

COES

Head and bar forged from a single piece of steel; jaws case hardened; slide bar and handle frame of steel; oil finished; machine cut steel screw with knurled head; hardwood or steel handle.

Length, Inches	6	8	10
Jaws Open, Inches	7/8	1 1/4	1 3/4
Weight per Dozen, Lbs.	9	16	25
Per Dozen	$15.00	18.00	22.00

Length, Inches	12	15	18	21
Jaws Open, Inches	2 1/8	2 5/8	3	4 1/8
Weight per Dozen, Lbs.	28	55	80	108
Per Dozen	$28.00	38.00	48.00	58.00

P. S. & W.

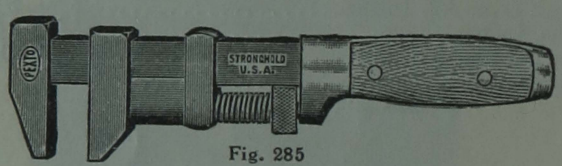

Fig. 285

STRONGHOLD

Forged from solid steel; head and bar in one piece extending entire length of handle; handle frame is forced on and then rivetted; head and jaws properly hardened; hardwood grips secured by two rivets. Black finish.

NO. 25

Length, Inches	6	8	10
Jaws Open, Inches	7/8	1 1/4	1 3/4
Weight per Dozen, Lbs.	9	16	25
Per Dozen	$15.00	18.00	22.00

Length, Inches	12	15	18	21
Jaws Open, Inches	2 1/8	2 9/16	3 1/8	4
Weight per Dozen, Lbs.	40	53	80	105
Per Dozen	$28.00	38.00	48.00	58.00

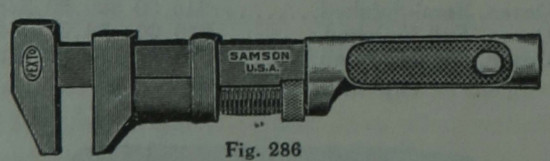

Fig. 286

SAMSON

Similar in construction to the Stronghold wrench, but with steel handle. Designed for railroad and industrial requirements. Black finish.

NO. 35

Length, Inches	6	8	10
Jaws Open, Inches	7/8	1 1/4	1 3/4
Weight per Dozen, Lbs.	14	17	28
Per Dozen	$15.00	18.00	22.00

Length, Inches	12	15	18	21
Jaws Open, Inches	2 1/8	2 9/16	3 1/8	4
Weight per Dozen, Lbs.	42	64	105	150
Per Dozen	$28.00	38.00	48.00	58.00

All above, 6 to 12 Inch, One-half Dozen in a box; 15—18 Inch, One-third Dozen; 21 Inch, One-twelfth.

KEY MODEL WRENCHES

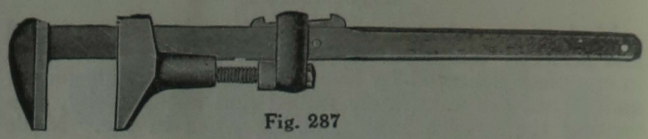

Fig. 287

Forged steel; one-piece handle; case hardened jaws. Machine cut steel screw with knurled head; Oil finished.

Length, Inches	28	36	48
Jaws Open, Inches	5 1/8	6 1/4	9 1/2
Weight Each, Lbs.	19	27	62
Each	$18.00	38.00	84.00

Packed Loose.

ADJUSTABLE "S" NUT WRENCHES

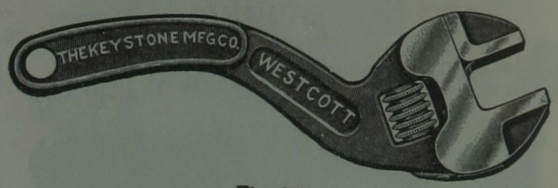

Fig. 288

Malleable iron handle, jaw forged steel.

This wrench is acknowledged to be the most convenient and useful for general use, and can be used in many places inaccessible to the monkey wrench.

NOS.	Length, Inches	Opens, Inches	Weight, Lbs.	Dozen
76	6	3/4	6	$ 8.00
78	8	1	10 1/4	10.00
80	10	1 3/8	19	12.00
82	12	1 5/8	33	18.00
84	14	2	51	24.00

One-half Dozen in a Package

ADJUSTABLE END WRENCHES

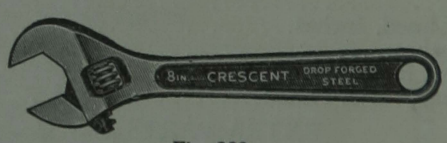

Fig. 289

Drop forged from one piece highest grade carbon tool steel; hardened and toughened by special heat-treating process, movable jaw, case hardened; polished jaws and frame; black enameled finish handle; steel knurled adjusting screw.

Size, Inches	Capacity, Inches	Weight Each, Lbs.	Per Dozen
4	1/2	1/8	$ 7.80
6	3/4	1/4	7.80
8	1	1/4	9.60
10	1 1/8	1 1/8	12.00
12	1 1/4	2	18.00
15	1 11/16	4 1/4	27.00
18	2	7	39.00

One-twelfth Dozen in a Box

PIPE WRENCHES
TRIMO

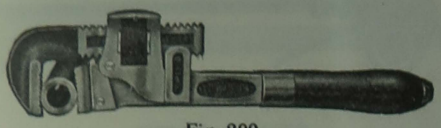

Fig. 290

Wood Handle

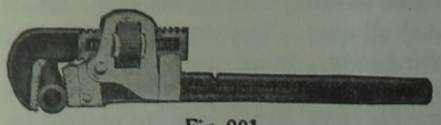

Fig. 291

Steel Handle

Drop forged from selected bar steel; milled jaws; interchangeable parts. Grips firmly and will not crush pipe or slip. Inserted jaw in handle can be replaced when worn. Provided with nut guards, which prevent accidental rotation of nut while in use. Wood handles made in sizes 6 to 14 inches only; steel handles made in all sizes.

Length, Inches	6	8	10	14
Pipe Capacity, Inches	⅛ to ½	⅛ to ¾	⅛ to 1	¼ to 1½
Weight Each, Lbs.	7/16	¾	1½	3
Each	$2.00	2.25	2.50	3.50
Length, Inches	**18**	**24**	**36**	**48**
Pipe Capacity, Inches	¼ to 2	¼ to 2½	½ to 3½	1 to 5
Weight Each, Lbs.	5	8½	16¾	24
Each	$5.00	7.25	13.50	20.00

Unless otherwise specified on orders for sizes 6 to 14 inches, wood handles will be sent.

PARTS FOR ABOVE WRENCHES

For Sizes Inches	6	8	10	14
Movable Jaws, Each	$0.75	.80	.85	1.15
Nuts, Each	$0.12	.15	.20	.30
Insert Jaws, Each	$0.35	.40	.50	.60
Frames, Each	$0.38	.42	.50	.60
Springs, Each	$0.03	.03	.03	.03
Frame Pins, Each	$0.03	.03	.04	.04
Jaw Pins, Each	$0.03	.03	.04	.04
Steel Handles, Each	$0.95	1.00	1.10	1.50
Wood Handles with Ferrule, Each	$0.16	.16	.18	.25
Nut Guards, per Pair	$0.15	.15	.20	.30
For Sizes, Inches	**18**	**24**	**36**	**48**
Movable Jaws, Each	$1.75	2.25	4.35	7.50
Nuts, Each	$0.35	.55	1.10	1.50
Insert Jaws, Each	$0.70	.80	1.10	2.00
Frames, Each	$0.75	.95	1.70	2.20
Springs, Each	$0.04	.04	.04	.04
Frame Pins, Each	$0.04	.04	.05	.05
Jaw Pins, Each	$0.04	.04	.05	.05
Steel Handles, Each	$2.25	3.50	7.00	10.50
Nut Guards, per Pair	$0.35	.45	.55	.65

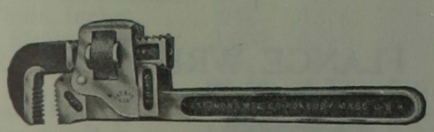

Fig. 292

NARROW JAW

Designed for automobile and gasfitters' use. Made with narrow jaw and of light weight from selected bar steel.

Length, Inches	6	8	10
Pipe Capacity, Inches*	½	¾	1
Weight Each, Lbs.	3/8	5/8	1¼
Each	$2.00	2.25	2.50

* All sizes of these wrenches will hold from ⅛-inch wire up to their rated capacity.

PIPE WRENCHES
STILLSON PATTERN

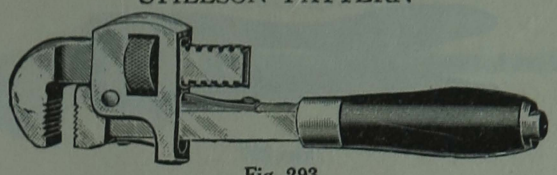

Fig. 293

Wood Handle

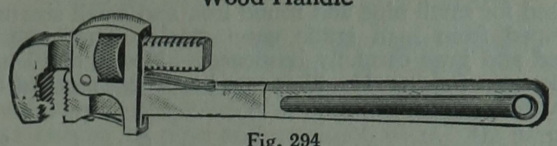

Fig. 294

Steel Handle

Drop forged from steel and carefully fitted; milled jaws; well finished. Wood handles made in sizes 6 to 14 inches only; steel handles made in all sizes. Steel handle wrenches in sizes 6 to 14 inches have holes in the ends of handles.

Length, Inches	6	8	10	14
Pipe Capacity, Inches	⅛ to ½	⅛ to ¾	⅛ to 1	¼ to 1¼
Weight Each, Lbs.	¼	½	1 1/16	2¾
Each	$2.00	2.25	2.50	3.50
Length, Inches	**18**	**24**	**36**	**48**
Pipe Capacity, Inches	¼ to 2	¼ to 2½	½ to 3½	1 to 5
Weight Each, Lbs.	4⅞	8	15	25
Each	$5.00	7.25	13.50	20.00

Unless otherwise specified on orders for sizes 6 to 14 inches, wood handles will be sent.

PARTS FOR ABOVE WRENCHES

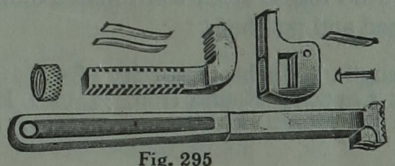

Fig. 295

Length, Inches	6	8	10	14
Jaws, Each	$0.75	.80	.85	1.15
Frames, Each	$0.38	.42	.50	.60
Adjusting Nuts, Each	$0.12	.15	.20	.30
Bars for Wood Handle, Each	$0.95	1.00	1.10	1.50
Bars with Steel Handle, Each	$0.95	1.00	1.10	1.50
Wood Handles, Each	$0.16	.16	.18	.25
Frame Pins, Each	$0.03	.03	.04	.04
Springs, Each	$0.10	.10	.10	.10
Spring Rivets, Each	$0.01	.01	.02	.02
End Nuts, Each	$0.15	.15	.20	.20
Length, Inches	**18**	**24**	**36**	**48**
Jaws, Each	$1.75	2.25	4.35	7.50
Frames, Each	$0.75	.95	1.70	2.20
Adjusting Nuts, Each	$0.35	.55	1.10	1.50
Bars with Steel Handle, Each	$2.25	3.50	7.00	10.50
Frame Pins, Each	$0.04	.04	.05	.05
Springs, Each	$0.10	.11	.13	.13
Spring Rivets, Each	$0.02	.02	.02	.02

ALLIGATOR

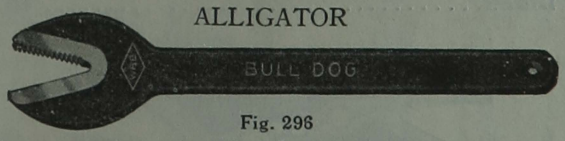

Fig. 296

Drop forged, teeth milled **diagonally** and jaws hardened and polished.

NOS.	2	2½	3
Length, Inches	9	12½	15
Pipe Capacity, Inches	3/8–¾	3/8–1	½–1¼
Weight per Dozen, Lbs.	13	18⅓	36
Per Dozen	$12.00	18.00	24.00
NOS.	4	4½	5
Length, Inches	21	24	27
Pipe Capacity, Inches	1¼–2	1½–2½	2–3
Weight per Dozen, Lbs.	78	114	147
Per Dozen	$36.00	50.00	60.00

PIPE WRENCHES

Fig. 297

ALLIGATOR

Used for small pipe and round iron and small size nuts. Stamped from high grade sheet steel. The teeth are milled and jaws carefully hardened. Nos. 0 and 1 have black satin finish. No. 21 is case hardened, mottled and lacquered.

NOS.	0	1	21
Length, Inches	4	5¾	5¾
Capacity Pipe, Inch	⅛–¼	⅛–⅜	⅛–⅜
Capacity Round Iron, Inch	¼–9/16	¼–¾	¼–¾
Weight per Dozen, Lbs.	1¼	3½	3½
Per Dozen	**$3.00**	**4.00**	**8.00**

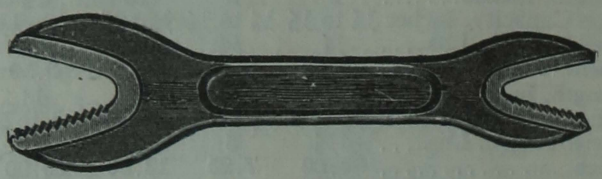

Fig. 298

TWIN

Made of drop forged steel, teeth milled diagonally and jaws hardened and polished.

	Per Dozen
NO. 10—Length, 10 Inches; Capacity Pipe, ⅛ to ¾ Inches; Capacity Round Iron, ¼ to 1 Inch; Weight per Dozen, 14 Lbs.	**$18.00**

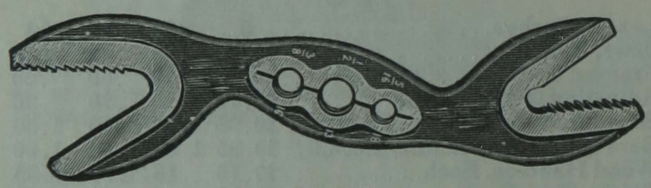

Fig. 299

VIXEN

Drop forged, ground, polished and hardened. The two ends are milled with teeth of capacity to turn pipe from ¼ to 1¼ inches. The tapped holes in the center are made to restore or clean threads on bolts that have become bruised or battered; furnished either with U. S. or Whitworth standard threads, 5/16-18, ½-13, ½-12, ⅜-16, 7½ inches long.

Finish	**Blue**
Weight per Dozen, Lbs.	11
Per Dozen	**$5.00**

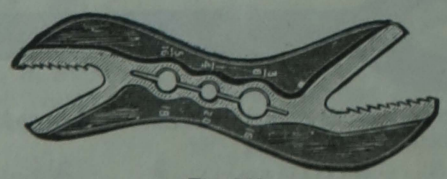

Fig. 300

BABY VIXEN

Similar to Vixen, but of smaller size for pipe from ¼ to ¾ inches. Tapped holes in U. S. or Whitworth threads, 5/16, ¼ and ⅜-5½ inches long.

Finish	**Blue**
Weight per Dozen, Lbs.	6
Per Dozen	**$4.50**

PIPE WRENCHES

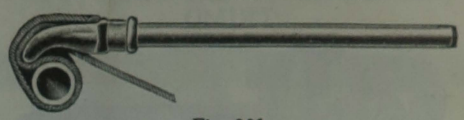

Fig. 301

STRAP TYPE

For screwing up all kinds of nickel plated and polished pipe tubing or shafting without marring. Made of steel, nickel plated all over. The straps are of specially woven linen webbing; when worn can be changed end for end, thereby increasing its life. It is necessary to use either rosin, whiting or chalk on the strap to prevent its slipping.

Length, Inches	12	18
Capacity, Inches	⅛ to 2	1 to 5
Weight Each, Lbs.	1½	3¼
Each	**$1.50**	**2.50**
Extra Straps, Each	**.25**	**.50**

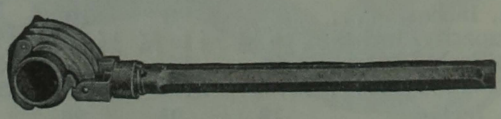

Fig. 302

PARMELEE

Made of steel; adapted for handling brass pipe, smooth rods or nickel plated tubing. Positive grip without lost motion. Has no teeth and will not mar the pipe or threads. Makes or breaks the tightest joint easily; can be operated in close quarters.

NOS.	1	2
Length Handle, Inches.	10	20
Capacity, Inches	⅜, ½, ¾, 1	1, 1¼, | 1½, 2
Weight Each, Lbs.	2½	3
Girths, Each	**$ .75**	**1.00 | 1.25**
Handles, Each	**$2.25**	**3.00**
Complete, Each	**$5.00**	**7.50**

NOS.	3	4
Length Handle, Inches.	25	....
Capacity, Inches	2, 2½, 3	3 | 4
Weight Each, Lbs.	4½	5
Girths, Each	**$1.50**	**2.50 | 3.00**
Handles, Each	**$5.00**	**7.50**
Complete, Each	**$9.50**	**13.00**

FLANGE WRENCHES

Fig. 303

Can be used for quickly making or taking off flanges. Has ratchet with reversible pawl, operates in either direction. Wrench is bolted to face of flange through slots in the wheel.

	Each
6 Inches and Smaller	**$16.00**

PIPE WRENCHES

VULCAN

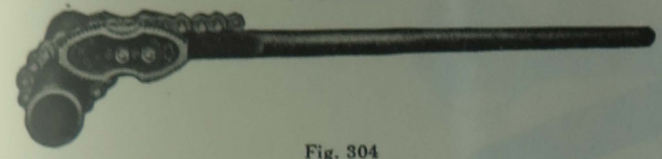

Fig. 304

IMPROVED—WITH FLAT LINK CHAIN

Made from wrought steel. Have reversible jaws, quickly changed end for end as teeth first in use wear out. Jaws fastened to handle with two steel studs, easily replaced. Teeth are straight cut, which means that gripping pressure is evenly distributed preventing tearing of pipe and wearing out of teeth in one spot. Chains are handmade from special steel, proof tested to two-thirds of their breaking strain and swing from the center so can be used on both sides of jaws.

NOS.	30	31	32	33
Pipe Capacity, Inches	⅛–¾	⅛–1½	¼–2½	¾–4
Length Over All, Inches	13¾	20	27	37
Length Chain, Inches	9½	13½	17½	22½
Breaking Strain, Lbs.	3600	6700	9800	12,500
Weight Each, Lbs.	2⅜	5¾	10	16
Each	$2.50	3.50	5.00	7.00
Extra Chain, Each	$0.75	1.00	1.50	2.50
Extra Jaws, per Pair	$1.00	1.75	2.75	4.00
Extra Nuts and Studs, per Set	$0.20	.25	.35	.45

NOS.	33½	34	35	*16
Pipe Capacity, Inches	1–6	1½–8	2–12	4–18
Length Over All, Inches	44½	50½	64½	87
Length Chain, Inches	31	39	54½	74½
Breaking Strain, Lbs.	14,300	15,700	21,600	40,000
Weight Each, Lbs.	24	31	50	137
Each	$9.00	11.00	18.00	40.00
Extra Chain, Each	$3.50	4.50	7.50	20.00
Extra Jaws, per Pair	$4.75	5.50	7.50	16.00
Extra Nuts and Studs, per Set	$0.55	.70	.90	.....

* Wrenches for pipe larger than 12 inches have non-reversible jaws.

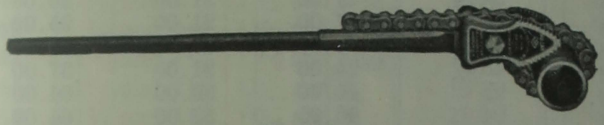

Fig. 305

OLD STYLE

Similar in construction to the improved type, except that it is not furnished with reversible jaws.

NOS.	10	11	12	13
Pipe Capacity, Inches	⅛-¾	⅛-1½	¼-2½	¾-4
Length Over All, Inches	13¾	20	27	37
Length Chain, Inches	9½	13½	17½	22½
Breaking Strain, Lbs.	3,600	6,700	9,800	12,500
Weight Each, Lbs.	1¾	5¾	10	16
Each	$2.50	3.50	5.00	7.00
Extra Chain, Each	$0.75	1.00	1.50	2.50
Extra Jaws, per Pair	$1.00	1.75	2.75	4.00
Extra Screws and Pins, per Set	$0.20	.22	.25	.30

NOS.	13½	14	15	16
Pipe Capacity, Inches	1-6	1½-8	2-12	4-18
Length Over All, Inches	44½	50½	64½	87
Length Chain, Inches	31	39	54½	74½
Breaking Strain, Lbs.	14,300	15,700	21,800	40,000
Weight Each, Lbs.	24	31	50	137
Each	$9.00	11.00	18.00	40.00
Extra Chain, Each	$3.50	4.50	7.50	20.00
Extra Jaws, per Pair	4.75	5.50	7.50	16.00
Extra Screws and Pins, per Set	$0.35	.40	.50	1.30

PIPE WRENCHES

VULCAN

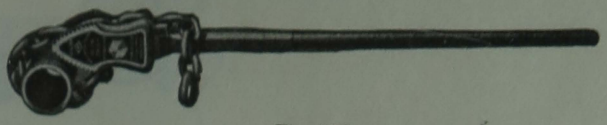

Fig. 306

OLD STYLE—WITH CABLE CHAIN

Made from wrought steel. Have single ended, non-reversible jaws which are fastened to handles with tough steel studs easily replaced. Teeth are straight cut, which provides equal distribution of gripping pressure and prevents tearing of pipe and one-spot wear. All parts of wrenches are interchangeable. Chains swing from the center and can be used on either side of jaws.

NOS.	10	11	12	13
Pipe Capacity, Inches	⅛-¾	⅛-1½	¼-2½	¾-4
Length Over All, Inches	13¾	20	27	37
Length Chain, Inches	9¾	14½	18	27
Breaking Strain, Lbs.	1,200	4,000	6,000	10,500
Weight Each, Lbs.	1¾	5¾	10	16
Each	$2.50	3.50	5.00	7.00
Extra Chain, Each	$0.75	1.00	1.50	2.50
Extra Jaws, per Pair	$1.00	1.75	2.75	4.00
Extra Screws and Pins, per Set	$0.20	.22	.25	.30

NOS.	13½	14	15	16
Pipe Capacity, Inches	1-6	1⅛-8	2-12	4-18
Length Over All, Inches	44½	50½	64½	87
Length Chain, Inches	33½	42	57	76
Breaking Strain, Lbs.	12,500	15,000	19,000	40,000
Weight Each, Lbs.	24	31	50	137
Each	$9.00	11.00	18.00	40.00
Extra Chain, Each	$3.50	4.50	7.50	20.00
Extra Jaws, per Pair	$4.75	5.50	7.50	16.00
Extra Screws and Pins, per Set	$0.35	.40	.50	1.30

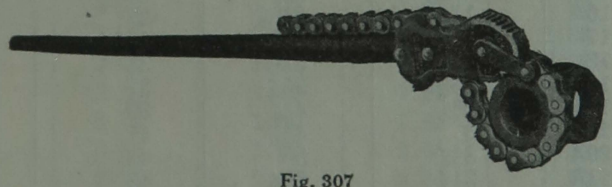

Fig. 307

AGRIPPA—WITH FLAT LINK CHAIN

Made from wrought steel, with single jaw tempered for file sharpening. Unsurpassed for cramped and irregular fittings which cannot be handled effectively with broader jawed wrenches. Suitable for use on flanges, short nipples and R. and L. hand fittings. All parts are interchangeable.

NOS.	20	21	22
Fitting Capacity, Inches	⅛-¾	⅛-1½	¼-2½
Length Over All, Inches	13¾	20	27
Length Chain, Inches	10	15	19½
Breaking Strain, Lbs.	3,600	6,700	9,800
Weight Each, Lbs.	2½	5¾	9¾
Each	$2.50	3.50	5.00
Extra Chain, Each	$1.00	1.25	1.75
Extra Jaws, Each	$1.00	1.75	2.75

NOS.	23	23½	24	25
Fitting Capacity, Inches	¾-4	1-6	1½-8	2-12
Length Over All, Inches	37	44½	50½	64½
Length Chain, Inches	26	34	45	61
Breaking Strain, Lbs.	12,500	14,300	15,700	21,800
Weight Each, Lbs.	17	24	32	56
Each	$7.00	9.00	11.00	18.00
Extra Chain, Each	$2.75	4.00	5.00	8.00
Extra Jaws, Each	$4.00	4.75	5.50	7.50

ENGINEERS' WRENCHES

Fig. 308

15° ANGLE—SINGLE HEAD

Drop-forged of best mild steel. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case-hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished, case-hardened (mottled color), and lacquered, heads bright. Order by number and specify finish.

NOS.	U. S. Standard Nut; Bolt Size, Inches	Openings Milled, Inches	Approx. Length, Inches	Thickness Head, Inches	Approx. Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
00	1/8	5/16	3	5/32	1/20	$0.09	$0.14	$0.22
0	3/16	13/32	3 1/2	3/16	1/16	.10	.15	.25
1	1/4	1/2	4	1/4	1/8	.12	.18	.28
2	5/16	19/32	4 3/4	9/32	1/5	.15	.22	.32
3	3/8	11/16	5 5/8	5/16	5/16	.18	.26	.38
4	7/16	25/32	6 1/2	11/32	5/12	.22	.32	.45
5	1/2	7/8	7 1/2	13/32	1/2	.26	.38	.54
6	9/16	31/32	8 3/8	7/16	3/4	.31	.46	.65
7	5/8	1 1/16	9 1/4	1/2	1	.40	.57	.82
8	3/4	1 1/4	11 1/8	9/16	1 7/12	.55	.75	1.05
9	7/8	1 7/16	13	21/32	2 1/2	.85	1.15	1.52
10	1	1 5/8	14 3/4	3/4	4	1.20	1.60	2.10
11	1 1/8	1 13/16	16 1/2	27/32	4 2/3	1.65	2.10	2.80
12	1 1/4	2	18 1/2	29/32	7	2.20	2.85	3.70
13	1 3/8	2 3/16	20	1	8 1/6	2.80	3.65	4.70
14	1 1/2	2 3/8	22	1 1/16	10 1/6	3.45	4.60	5.80
15	1 5/8	2 9/16	24	1 1/8	11 1/2	4.15	5.60	7.10
16	1 3/4	2 3/4	25 1/2	1 7/32	14 1/3	4.90	6.70	8.50
16A	1 7/8	2 15/16	27	1 7/32	13 1/2	4.90	6.70	8.50
17	2	3 1/8	29 1/2	1 3/8	20	7.50	10.25	13.00
18	2 1/4	3 1/2	33	1 17/32	28 3/4	11.50	14.75	18.00
19	2 1/2	3 7/8	37	1 5/8	34 1/2	17.00	21.00	25.00
19A	2 3/4	4 1/4	39	1 5/8	34	17.00	21.00	25.00
20	3	4 5/8	41	1 7/8	52	25.00	31.00	37.00
20A	3 1/4	5	43	1 7/8	48 1/2	25.00	31.00	37.00
21A	3 1/2	5 3/8	45	2 1/2	95	40.00	52.00	64.00
21B	3 3/4	5 3/4	47	2 1/2	94	40.00	52.00	64.00
21C	4	6 1/8	49	2 1/2	85 1/2	40.00	52.00	64.00
22A	4 1/2	6 7/8	51	3	167	80.00	102.00	124.00
22B	5	7 5/8	53	3	156	80.00	102.00	124.00

The following semi-finished and finished wrenches have hole in end of handle.

NOS	17	18	19	19A	20	20A	21A	21B	21C	22A	22B
Diameter Hole, Inches	5/8	3/4	7/8	7/8	1	1	1 1/8	1 1/8	1 1/8	1 1/4	1 1/4

Unless otherwise specified, semi-finished wrenches will be supplied.

Nos. 00 to 3, One Dozen in Box; 4 to 8, One-half Dozen in Box
Nos. 9 to 22B, Loose

FINISH OF WRENCHES

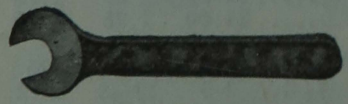

Fig. 309
Unfinished

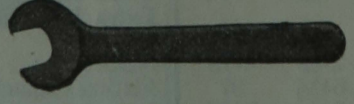

Fig. 310
Semi-Finished

Fig. 311
Finished

Unfinished wrenches are milled only. Semi-finished are milled, case-hardened, black lacquered and heads ground bright. Finished are milled; polished all over; case-hardened (mottled color) and lacquered; heads bright.

Unless otherwise specified, semi-finished wrenches will be supplied.

ENGINEERS' WRENCHES

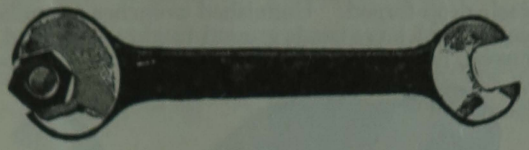

Fig. 312

15° ANGLE—DOUBLE HEAD

Made from the best mild steel, drop-forged. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished, case-hardened (mottled color) and lacquered, heads bright. Order by number and specify finish.

NOS.	U. S. Standard Nut; Bolt, Size, Inches	Openings Milled, Inches	Length, Inches	Thickness Heads, Inches	Weight Each, Lbs.	Un-finished, Each	Semi-finished, Each	Finished, Each
21	1/8 and 3/16	5/16 and 13/32	3 1/2	3/16	1/16	$0.12	$0.17	$0.26
22	1/8 and 1/4	5/16 and 1/2	4	1/4	1/8	.14	.21	.32
23	3/16 and 1/4	13/32 and 1/2	4	1/4	1/7	.14	.21	.32
24	3/16 and 5/16	13/32 and 19/32	4 7/8	9/32	1/4	.17	.25	.38
25	1/4 and 5/16	1/2 and 19/32	4 7/8	9/32	1/4	.17	.25	.38
26	1/4 and 3/8	1/2 and 11/16	5 7/8	5/16	5/16	.21	.31	.46
27	5/16 and 3/8	19/32 and 11/16	5 7/8	5/16	5/16	.21	.31	.46
28	5/16 and 7/16	19/32 and 25/32	6 7/8	11/32	7/16	.25	.37	.56
29	3/8 and 7/16	11/16 and 25/32	6 7/8	11/32	7/16	.25	.37	.56
30	3/8 and 1/2	11/16 and 7/8	7 7/8	13/32	5/8	.30	.45	.68
31	7/16 and 1/2	25/32 and 7/8	7 7/8	13/32	5/8	.30	.45	.68
32	7/16 and 9/16	25/32 and 31/32	8 3/4	7/16	15/16	.37	.55	.85
33	1/2 and 9/16	7/8 and 31/32	8 3/4	7/16	15/16	.37	.55	.85
34	1/2 and 5/8	7/8 and 1 1/16	9 3/4	1/2	1 1/4	.46	.68	1.08
35	9/16 and 5/8	31/32 and 1 1/16	9 3/4	1/2	1 1/5	.46	.68	1.08
36	9/16 and 3/4	31/32 and 1 1/4	11 5/8	9/16	1 7/8	.66	.96	1.40
37	5/8 and 3/4	1 1/16 and 1 1/4	11 5/8	9/16	1 7/8	.66	.96	1.40
38	5/8 and 7/8	1 1/16 and 1 7/16	13 1/2	21/32	2 2/3	1.00	1.40	1.90
39	3/4 and 7/8	1 1/4 and 1 7/16	13 1/2	21/32	2 2/3	1.00	1.40	1.90
40	3/4 and 1	1 1/4 and 1 5/8	15 1/2	3/4	3 13/16	1.40	1.90	2.60
41	7/8 and 1	1 7/16 and 1 5/8	15 1/2	3/4	3 7/16	1.40	1.90	2.60
42	7/8 and 1 1/8	1 7/16 and 1 13/16	17	27/32	5 1/2	1.90	2.65	3.50
43	1 and 1 1/8	1 5/8 and 1 13/16	17	27/32	5 3/8	1.90	2.65	3.50
44	1 and 1 1/4	1 5/8 and 2	19	29/32	7 11/12	2.60	3.60	4.70
45	1 1/8 and 1 1/4	1 13/16 and 2	19	29/32	7 5/8	2.60	3.60	4.70
46	1 1/8 and 1 1/8	1 13/16 and 2 3/16	21	1	9 1/2	3.80	5.25	6.70
47	1 1/4 and 1 3/8	2 and 2 3/16	21	1	9 5/12	3.80	5.25	6.70
48	1 1/4 and 1 1/2	2 and 2 3/8	23	1 1/16	13 3/4	5.20	7.00	8.80
49	1 3/8 and 1 1/2	2 3/16 and 2 3/8	23	1 1/16	12 1/2	5.20	7.00	8.80
50	1 3/8 and 1 5/8	2 3/16 and 2 9/16	25	1 and 1 1/8	13 1/4	6.75	9.00	11.25
51	1 1/2 and 1 5/8	2 3/8 and 2 9/16	25	1 1/16 and 1 1/8	14 3/4	7.40	9.90	12.40
52	1 1/2 and 1 3/4	2 3/8 and 2 3/4	27	1 1/16 and 1 17/32	16 3/4	8.35	11.00	13.65
53	1 5/8 and 1 3/4	2 9/16 and 2 3/4	27	1 1/8 and 1 17/32	18 1/6	9.00	12.00	15.00
54	1 5/8 and 2	2 9/16 and 3 1/8	31	1 1/8 and 1 3/8	24	11.00	14.25	17.50
55	1 3/4 and 2	2 3/4 and 3 1/8	32	1 17/32 and 1 3/8	24	12.00	15.50	19.00
56	1 3/4 and 2 1/4	2 3/4 and 3 1/2	34	1 17/32 and 1 17/32	31	16.00	20.00	24.00
57	2 and 2 1/4	3 1/8 and 3 1/2	36	1 3/8 and 1 17/32	34	18.50	23.50	28.50
57A	2 and 2 1/2	3 1/8 and 3 7/8	37	1 3/8 and 1 5/8	38 3/4	23.00	28.00	33.00
58	2 1/4 and 2 1/2	3 1/2 and 3 7/8	38	1 17/32 and 1 5/8	45	26.00	31.00	36.00
59	2 1/4 and 2 3/4	3 1/2 and 4 1/4	39	1 17/32 and 1 5/8	42 1/2	26.00	31.00	36.00
60	2 1/2 and 2 3/4	3 7/8 and 4 1/4	40	1 5/8 and 1 5/8	48	30.00	37.50	45.00
61	2 1/2 and 3	3 7/8 and 4 5/8	42	1 5/8 and 1 7/8	66	38.00	47.00	56.00
62	2 3/4 and 3	4 1/4 and 4 5/8	44	1 5/8 and 1 7/8	66 1/2	38.00	47.00	56.00
63	2 3/4 and 3 1/2	4 1/4 and 5 3/8	46	1 5/8 and 2 1/2	95	55.00	67.50	80.00
64	3 and 3 1/2	4 5/8 and 5 3/8	48	1 7/8 and 2 1/2	113 1/2	65.00	77.50	90.00

Nos. 21 to 28 are packed One Dozen in Box; Nos. 29 to 37 are packed One-half Dozen in Box; No. 38 to 60 are Loose. Unless otherwise specified, Semi-finished Wrenches will be supplied.

"S" WRENCHES

Made from the best mild steel, drop-forged. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case-hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished case-hardened (mottled color) and lacquered, heads bright. Order by number and specify finish.

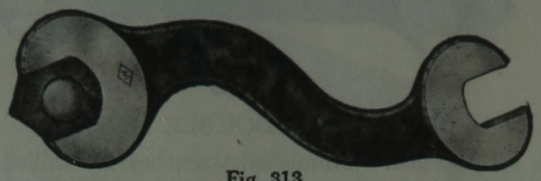

Fig. 313

FLAT HANDLE—22½° ANGLE—DOUBLE HEAD
FOR U. S. STANDARD NUTS

NOS.	U. S. Standard Nut: Diam. Bolt, Inches	Openings Milled, Inches	Approximate Length, Inches	Thickness Head, Inch	Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
661A	1/8 and 3/16	5/16 and 13/32	4	9/32	1/5	$0.15	$0.22	$0.32
661B	1/8 and 1/4	5/16 and 1/2	4	9/32	1/5	.15	.22	.32
661C	3/16 and 1/4	13/32 and 1/2	4	9/32	1/5	.15	.22	.32
662A	3/16 and 5/16	13/32 and 19/32	5	5/16	1/3	.20	.29	.42
662B	1/4 and 5/16	1/2 and 19/32	5	5/16	1/3	.20	.29	.42
662C	1/4 and 3/8	1/2 and 11/16	5	5/16	1/3	.20	.29	.42
663A	5/16 and 3/8	19/32 and 11/16	6 1/4	3/8	1/2	.27	.39	.56
663B	5/16 and 7/16	19/32 and 25/32	6 1/4	3/8	1/2	.27	.39	.56
663C	3/8 and 7/16	11/16 and 25/32	6 1/4	3/8	1/2	.27	.39	.56
664A	3/8 and 1/2	11/16 and 7/8	7 1/2	7/16	1	.37	.53	.75
664B	7/16 and 1/2	25/32 and 7/8	7 1/2	7/16	1	.37	.53	.75
664C	7/16 and 9/16	25/32 and 31/32	7 1/2	7/16	1	.37	.53	.75
665A	1/2 and 9/16	7/8 and 31/32	9	1/2	1 1/3	.50	.72	1.00
665B	1/2 and 5/8	7/8 and 1 1/16	9	1/2	1 1/3	.50	.72	1.00
665C	9/16 and 5/8	31/32 and 1 1/16	9	1/2	1 1/3	.50	.72	1.00
666A	9/16 and 3/4	31/32 and 1 1/4	10 1/2	9/16	2 1/16	.74	1.00	1.35
666B	5/8 and 3/4	1 1/16 and 1 1/4	10 1/2	9/16	2 1/16	.74	1.00	1.35
666C	5/8 and 7/8	1 1/16 and 1 7/16	10 1/2	9/16	2 1/16	.74	1.00	1.35
667A	3/4 and 7/8	1 1/4 and 1 7/16	12	5/8	3 1/2	1.10	1.45	1.90
667B	3/4 and 1	1 1/4 and 1 5/8	12	5/8	3 1/2	1.10	1.45	1.90
667C	7/8 and 1	1 7/16 and 1 5/8	12	5/8	3 1/2	1.10	1.45	1.90
668A	7/8 and 1 1/8	1 7/16 and 1 13/16	14	3/4	5 1/2	1.90	2.50	3.20
668B	1 and 1 1/8	1 5/8 and 1 13/16	14	3/4	5 1/2	1.90	2.50	3.20
668C	1 and 1 1/4	1 5/8 and 2	14	3/4	5 1/2	1.90	2.50	3.20

Unless otherwise specified, semi-finished wrenches will be supplied.

One-half Dozen in a Box.

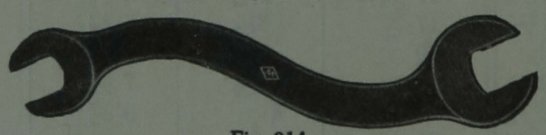

Fig. 314

LIGHT SERVICE WRENCHES
22½° ANGLE—DOUBLE HEAD

NOS.	Openings Milled, Inches	Extreme Length, Inch	Thickness Heads, Inch	Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
675B	3/8 and 7/16	6 1/4	1/4	1/4	$0.18	$0.27	$0.38
675A	3/8 and 1/2	6 1/4	1/4	1/4	.18	.27	.38
675	13/32 and 1/2	6 1/4	1/4	1/4	.18	.27	.38
677B	1/2 and 9/16	7 1/4	9/32	1/3	.23	.34	.47
677	1/2 and 5/8	7 1/4	9/32	1/3	.23	.34	.47
679A	9/16 and 11/16	8 1/4	5/16	1/2	.29	.43	.58
679	5/8 and 11/16	8 1/4	5/16	1/2	.29	.43	.58
681	11/16 and 27/32	9 1/4	3/8	3/4	.38	.55	.72
681B	3/4 and 13/16	9 1/4	3/8	3/4	.38	.55	.72
681A	3/4 and 7/8	9 1/4	3/8	3/4	.38	.55	.72
683	27/32 and 15/16	10 3/8	7/16	1	.50	.70	.90
683B	7/8 and 1	10 3/8	7/16	1	.50	.70	.90
683A	15/16 and 1	10 3/8	7/16	1	.50	.70	.90
685	1 and 1 1/8	12	1/2	1 3/4	.70	1.00	1.30
685A	1 and 1 1/4	12	1/2	1 3/4	.70	1.00	1.30
685C	1 1/16 and 1 1/4	12	1/2	1 3/4	.70	1.00	1.30
685B	1 1/8 and 1 1/4	12	1/2	1 3/4	.70	1.00	1.30

One-half Dozen in Box.

SET SCREW WRENCHES

Made from the best mild steel, drop-forged. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case-hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished, case-hardened (mottled color) and lacquered. Heads bright. Order by number and specify finish.

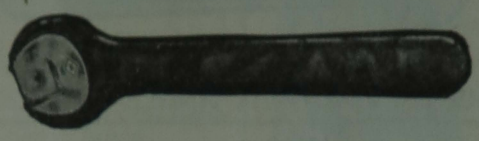

Fig. 315

22½° ANGLE—SINGLE HEAD

NOS.	Set Screw Size, Inches	Length Over All, Inches	Thickness Head, Inch	Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
500	3/16	3	3/16	1/6	$0.10	$0.14	$0.23
501	1/4	3 1/2	1/4	1/6	.12	.17	.27
502	5/16	4 1/4	5/16	1/5	.14	.21	.31
503	3/8	5	11/32	1/2	.17	.25	.37
504	7/16	5 3/4	3/8	1/2	.21	.31	.45
505	1/2	6 5/8	7/16	3/4	.26	.38	.54
506	9/16	7 1/2	1/2	5/6	.31	.46	65
507	5/8	8 1/2	9/16	1 1/3	.38	.55	.80
508	3/4	9 1/2	5/8	1 1/3	.48	.68	.98
509	7/8	10 1/2	11/16	1 3/4	.60	.84	1.20
510	1	11 1/2	3/4	2	.80	1.10	1.48
511	1 1/8	12 1/2	13/16	2 1/2	1.10	1.40	1.80

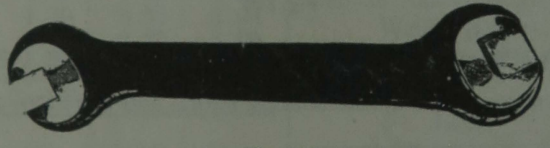

Fig. 316

22½° ANGLE—DOUBLE HEAD

NOS.	Set Screw Size, Inches	Length Over All, Inches	Thickness Head, Inch	Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
523	3/16x1/4	3 1/2	7/32	1/6	$0.14	$0.20	$0.30
524	3/16x5/16	4 1/4	9/32	1/4	.16	.24	.35
525	1/4x5/16	4 1/4	9/32	1/4	.16	.24	.35
526	1/4x3/8	5	11/32	1/3	.19	.29	.42
527	5/16x3/8	5	11/32	1/3	.19	.29	.42
528	5/16x7/16	5 3/4	3/8	1/3	.24	.35	.52
529	3/8x7/16	5 3/4	3/8	1/3	.24	.35	.52
530	3/8x1/2	6 5/8	7/16	1/2	.30	.45	.66
531	7/16x1/2	6 5/8	7/16	1/2	.30	.45	.66
532	7/16x9/16	7 1/2	1/2	3/4	.36	.54	.80
533	1/2x9/16	7 1/2	1/2	3/4	.36	.54	.80
534	1/2x5/8	8 1/2	9/16	1	.44	.65	.96
535	9/16x5/8	8 1/2	9/16	1	.44	.65	.96
536	9/16x3/4	9 3/4	5/8	1 1/2	.56	.80	1.15
537	5/8x3/4	9 3/4	5/8	1 1/2	.56	.80	1.15
538	5/8x7/8	11	11/16	2	.72	1.00	1.40
539	3/4x7/8	11	11/16	2	.72	1.00	1.40
540	3/4x1	12 1/2	3/4	2 1/2	.98	1.30	1.75
541	7/8x1	12 1/2	3/4	2 1/2	.98	1.30	1.75
542	7/8x1 1/8	14	13/16	3 3/4	1.35	1.75	2.25
543	1 x1 1/8	14	13/16	3 3/4	1.35	1.75	2.25

Unless otherwise specified, semi-finished wrenches will be furnished.

All Above, One-half Dozen in a Box

BOX WRENCHES

Made from the best mild steel, drop-forged. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished, case hardened mottled color and lacquered; heads bright.

Fig. 317

SQUARE OPENING—22½° ANGLE—SINGLE HEAD

NOS.	Set Screw Size, Inch	Length Over All, Inches	Head		Weight, Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
			Thickness, Inch	Outside Dia., Ins.				
580	3/16	3	1/4	1/2	1/6	$0.11	$0.15	$0.23
581	1/4	3 3/8	9/32	5/8	1/6	.12	.17	.27
582	5/16	3 3/4	5/16	11/16	1/5	.14	.20	.31
583	3/8	4 1/4	3/8	27/32	1/5	.16	.24	.35
584	7/16	4 7/8	7/16	31/32	1/4	.19	.28	.40
585	1/2	5 1/2	15/32	1 1/16	1/4	.23	.34	.48
586	9/16	6 1/4	1/2	1 3/16	1/4	.28	.41	.58
587	5/8	7	9/16	1 5/16	1/2	.35	.50	.70
588	3/4	8	5/8	1 9/16	3/4	.44	.62	.85
589	7/8	9	11/16	1 25/32	1 1/8	.60	.81	1.10
590	1	10	3/4	2	1 1/2	.80	1.05	1.40

Order by number and specify finish. Unless otherwise specified, semi-finished wrenches will be supplied.

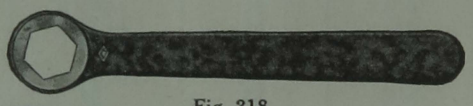

Fig. 318

HEXAGON OPENING—15° ANGLE—SINGLE HEAD

Designed for use where there is necessity for an exceedingly strong and light tool and places where head clearance is limited.

NOS.	U. S. Standard Nut; Bolt Size, Inches	Short Diameter Opening, Broached, Inches	Length Over All, Inches	Head		Weight Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
				Thickness, Inches	Outside Diameter, Inches				
800	3/16	13/32	3 1/2	3/16	3/4	1/8	$0.13	$0.18	$0.26
801	1/4	1/2	4	1/4	29/32	1/4	.15	.21	.30
802	5/16	39/64	4 7/8	9/32	1 3/32	1/4	.18	.25	.35
803	3/8	45/64	5 7/8	5/16	1 1/4	1/4	.21	.29	.40
804	7/16	51/64	6 7/8	11/32	1 3/8	1/3	.25	.35	.47
805	1/2	57/64	7 3/4	25/64	1 1/2	1/2	.30	.42	.56
806	9/16	63/64	8 3/4	7/16	1 5/8	1/2	.36	.50	.66
807	5/8	1 5/64	9 7/8	31/64	1 3/4	3/4	.45	.62	.82
808	3/4	1 17/64	11 1/2	9/16	2 1/16	1 1/4	.58	.78	1.05
809	7/8	1 29/64	13 3/8	21/32	2 3/8	1 3/4	.78	1.04	1.40
810	1	1 21/32	15 1/4	3/4	2 5/8	2 3/4	1.05	1.40	1.85
811	1 1/8	1 27/32	17 1/8	13/16	2 7/8	3	1.40	1.85	2.40
812	1 1/4	2 1/32	19	15/16	3 1/4	4 1/6	1.85	2.40	3.05
813	1 3/8	2 7/32	21	1	3 1/2	5 3/4	2.35	3.00	3.80
814	1 1/2	2 13/32	23	1 1/16	3 3/4	7 1/6	3.00	3.75	4.75
815	1 5/8	2 19/32	25	1 1/8	4	8 3/4	3.75	4.60	5.75
816	1 3/4	2 25/32	27	1 1/4	4 1/4	10 1/2	4.90	6.25	8.00
817	2	3 5/32	30 1/2	1 3/8	4 3/4	14 1/3	6.50	8.50	11.00
818	2 1/4	3 35/64	34	1 1/2	5 1/4	17 1/4	8.50	11.00	14.00
819	2 1/2	3 59/64	38	1 5/8	5 7/8	24 1/4	11.50	14.50	18.00
819A	2 3/4	4 19/64	42	1 3/4	6 1/2	....	15.00	18.50	22.50
820	3	4 43/64	46	1 7/8	7	42	20.00	25.00	30.00

Order by number and specify finish. Unless otherwise specified, semi-finished wrenches will be supplied.

All Above, Packed Loose

S WRENCHES

WITH CONCAVE HANDLES

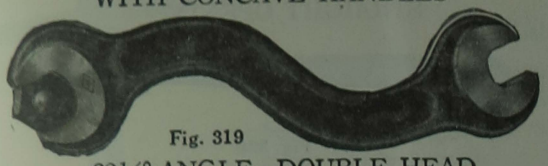

Fig. 319

22½° ANGLE—DOUBLE HEAD

Made from the best mild steel drop forged. Unfinished wrenches are milled only. Semi-finished wrenches are milled, case hardened, black lacquered and have heads ground bright. Finished wrenches are milled, polished, case hardened (mottled color) and lacquered, heads bright.

For U. S. Standard Nuts.

NOS.	U. S. Nuts; Bolt Size, Inches	Milled Openings, Inches	Wgt. Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
860A	1/8, 3/16	5/16, 13/32	1/6	$0.15	$0.22	$0.32
861A	1/8, 1/4	5/16, 1/2	1/4	.20	.29	.42
861B	3/16, 1/4	13/32, 1/2	1/4	.20	.29	.42
861C	3/16, 5/16	13/32, 19/32	1/4	.20	.29	.42
861X	1/4, 5/16	1/2, 19/32	1/4	.20	.29	.42
862A	1/4, 3/8	1/2, 11/16	1/2	.22	.32	.50
863A	5/16, 3/8	19/32, 11/16	1/2	.28	.40	.60
863B	5/16, 7/16	19/32, 25/32	1/2	.28	.40	.60
864A	3/8, 7/16	11/16, 25/32	3/4	.37	.53	.75
864B	3/8, 1/2	11/16, 7/8	3/4	.37	.53	.75
865A	7/16, 1/2	25/32, 7/8	1 1/6	.50	.72	1.00
865B	7/16, 9/16	25/32, 31/32	1 1/6	.50	.72	1.00
865C	1/2, 9/16	7/8, 31/32	1 1/6	.50	.72	1.00
865X	1/2, 5/8	7/8, 1 1/16	1 1/6	.50	.72	1.00
866A	9/16, 5/8	31/32, 1 1/16	1 2/3	.74	1.00	1.35
866B	9/16, 3/4	31/32, 1 1/4	1 2/3	.74	1.00	1.35
866C	5/8, 3/4	1 1/16, 1 1/4	1 2/3	.74	1.00	1.35
867A	5/8, 7/8	1 1/16, 1 7/16	1 5/6	1.10	1.45	1.90
867B	3/4, 7/8	1 1/4, 1 7/16	1 5/6	1.10	1.45	1.90
868A	3/4, 1	1 1/4, 1 5/8	4 3/4	1.70	2.30	3.00
868B	7/8, 1	1 7/16, 1 5/8	4 3/4	1.70	2.30	3.00
868C	7/8, 1 1/8	1 7/16, 1 13/16	4 3/4	1.70	2.30	3.00

For Hexagon Head Cap Screws.

NOS.	Diam. Hex. Head Cap Screws, Inches	Openings Milled, Inches	Wgt. Each, Lbs.	Unfinished, Each	Semi-finished, Each	Finished, Each
861D	3/16, 1/4	3/8, 7/16	1/4	$0.20	$0.29	$0.42
862D	3/16, 5/16	3/8, 1/2	1/2	.22	.32	.50
862E	3/16, 3/8	3/8, 9/16	1/2	.22	.32	.50
862F	1/4, 5/16	7/16, 1/2	1/2	.22	.32	.50
862G	1/4, 3/8	7/16, 9/16	1/2	.22	.32	.50
863D	5/16, 3/8	1/2, 9/16	1/2	.28	.40	.60
863E	5/16, 7/16	1/2, 5/8	1/2	.28	.40	.60
864D	5/16, 1/2	1/2, 3/4	3/4	.37	.53	.75
864E	3/8, 7/16	9/16, 5/8	3/4	.37	.53	.75
864F	3/8, 1/2	9/16, 3/4	3/4	.37	.53	.75
865D	7/16, 1/2	5/8, 3/4	1 1/6	.50	.72	1.00
865E	7/16, 9/16	5/8, 13/16	1 1/6	.50	.72	1.00
865F	1/2, 9/16	3/4, 13/16	1 1/6	.50	.72	1.00
865G	1/2, 5/8	3/4, 7/8	1 1/6	.50	.72	1.00
866D	1/2, 3/4	3/4, 1	1 2/3	.74	1.00	1.35
866E	9/16, 5/8	13/16, 7/8	1 2/3	.74	1.00	1.35
866F	9/16, 3/4	13/16, 1	1 2/3	.74	1.00	1.35
866G	5/8, 3/4	7/8, 1	1 2/3	.74	1.00	1.35
867D	5/8, 7/8	7/8, 1 1/8	1 5/6	1.10	1.45	1.90
867E	3/4, 7/8	1, 1 1/8	1 5/6	1.10	1.45	1.90
867F	3/4, 1	1, 1 1/4	1 5/6	1.10	1.45	1.90
867G	7/8, 1	1 1/8, 1 1/4	1 5/6	1.10	1.45	1.90
868D	7/8, 1 1/8	1 1/8, 1 3/8	4 3/4	1.70	2.30	3.00
868E	7/8, 1 1/4	1 1/8, 1 1/2	4 3/4	1.70	2.30	3.00
868F	1, 1 1/8	1 1/4, 1 3/8	4 3/4	1.70	2.30	3.00
868G	1, 1 1/4	1 1/4, 1 1/2	4 3/4	1.70	2.30	3.00
868X	1 1/8, 1 1/4	1 3/8, 1 1/2	4 3/4	1.70	2.30	3.00

Unless otherwise specified, semi-finished wrenches will be supplied.

WRENCH SETS

SUPERIOR—DROP FORGED

Sets are made up from Light Service wrenches.

Fig. 320

CARRIAGE MAKERS'

With openings for manufacturers' standard nuts.

Set No. 1

Consists of five S wrenches, individually listed below.

Unfinished, per Set.....$1.58
Semi-finished, per Set.....$2.29
Finished, per Set.....$3.05
Canvas Roll Only, Each.....$0.45

Weight per Set, 3 Lbs.

NOS.	Size Bolts, Inches	Openings Milled, Inch	Unfinished, Each	Semi-finished, Each	Finished, Each
675	13/32, 1/4	13/32, 1/2	$0.18	$0.27	$0.38
677	1/4, 5/16	1/2, 5/8	.23	.34	.47
679	5/16, 3/8	5/8, 11/16	.29	.43	.58
681	3/8, 7/16	11/16, 27/32	.38	.55	.72
683	7/16, 1/2	27/32, 15/16	.50	.70	.90

AUTOMOBILE "LIGHT"

With openings for S. A. E. Standard Nuts and Cap Screws.

Set No. 2 S

Consists of five S wrenches individually listed below.

Unfinished, per Set.....$2.10
Semi-finished, per Set.....$3.02
Finished, per Set.....$3.97
Canvas Roll Only, Each.....$0.45

Weight per Set, 4 Lbs.

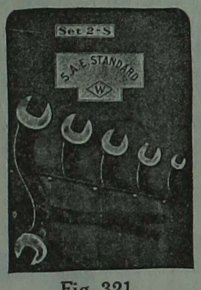

Fig. 321

NOS.	Size Bolts, Inch	Openings Milled, Inches	Unfinished, Each	Semi-finished, Each	Finished, Each
677S	1/4, 5/16	7/16, 1/2	$0.22	$0.34	$0.47
679A	3/8, 7/16	9/16, 5/8	.29	.43	.58
681A	1/2, 9/16	3/4, 7/8	.38	.55	.72
683A	5/8, 11/16	15/16, 1	.50	.70	.90
685C	3/4, 7/8	1 1/16, 1 1/4	.70	1.00	1.30

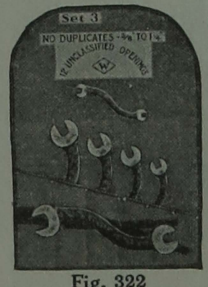

Fig. 322

GENERAL SERVICE

With openings milled for twelve popular nut and screw sizes.

Set No. 3

Consists of six S wrenches, individually listed below.

Unfinished, per Set.....$2.28
Semi-finished, per Set.....$3.29
Finished, per Set.....$4.35
Canvas Roll Only, Each.....$0.45

Weight per Set, 4½ Lbs.

NOS.	For Unclassified Nuts or Screws	Openings Milled, Inches	Unfinished, Each	Semi-finished, Each	Finished, Each
675B	Twelve	3/8, 7/16	$0.18	$0.27	$0.28
677B	Popular	1/2, 9/16	.23	.34	.47
679	Milled	5/8, 11/16	.29	.43	.58
681B	Openings—	3/4, 13/16	.38	.55	.72
683B	No	7/8, 1	.50	.70	.90
685B	Duplicates	1 1/8, 1 1/4	.70	1.00	1.30

TRACK WRENCHES

LONG HANDLE—STRAIGHT OPENING

Drop forged from highest grade steel. These wrenches are especially designed for railroad and car builders, work, where an extra long wrench is required.

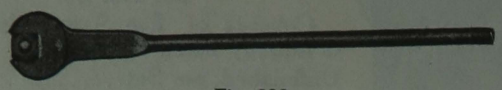

Fig. 323

ROUND HANDLE

Unfinished wrenches are milled. Semi-finished wrenches are milled and case-hardened all over; heads not ground.

NOS.	193	194	195	196a
U. S. S. Nuts, Bolt Size, Inch	5/8	3/4	..	7/8
Milled Opening, Inches	1 1/8	1 5/16	1 7/16	1 1/2
Length Over All, Inches	24	24	24	27
Weight Each, Lbs.	4 3/4	4 3/4	4 3/4	6
Unfinished, Each	**$1.10**	**1.10**	**1.10**	**1.50**
Semi-finished, Each	**$1.60**	**1.60**	**1.60**	**2.10**

NOS.	196	197	198	199a	199
U. S. S. Nuts, Bolt Size, Inches	..	1	..	1 1/8	..
Milled Opening, Inches	1 9/16	1 11/16	1 13/16	1 7/8	1 15/16
Length Over All, Inches	27	27	30	30	30
Weight Each, Lbs.	6	6	8 1/4	8 1/4	8 1/4
Unfinished, Each	**$1.50**	**1.50**	**3.00**	**3.00**	**3.00**
Semi-finished, Each	**$2.10**	**2.10**	**3.80**	**3.80**	**3.80**

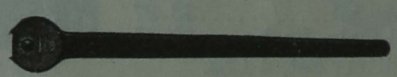

Fig. 324

FLAT HANDLE—SINGLE HEAD

Unfinished wrenches are milled only. Case-hardened wrenches to order.

NOS.	173	174	175	176	177
Outside Diam., Inches	1 3/16	1 1/4	1 3/8	1 1/2	1 5/8
Milled Opening, Inches	1 1/4	1 5/16	1 7/16	1 9/16	1 11/16
Length Over All, Inches	23	23	23	23	23
Thickness Head, Inch	5/8	5/8	5/8	11/16	11/16
Weight Each, Lbs.	4	4	4 3/4	6	6
Unfinished, Each	**$1.75**	**1.75**	**1.75**	**2.00**	**2.00**

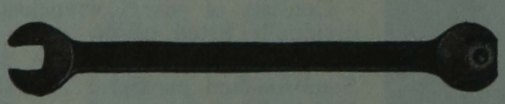

Fig. 325

FLAT HANDLE—DOUBLE HEAD

Unfinished wrenches are milled only. Case-hardened wrenches to order.

NOS.	182	184	186	188
Outside Diam., Inches	1 3/16x1 1/4	1 1/4x1 3/8	1 1/4x1 1/2	1 3/8x1 1/2
Milled Openings, Inches	1 1/4x1 5/16	1 5/16x1 7/16	1 5/16x1 9/16	1 7/16x1 9/16
Length Over All, Ins.	24	24	24	24
Thickness Head, Ins.	5/8	5/8	5/8x1 11/16	5/8x1 11/16
Weight Each, Lb.	6	6	6	6
Unfinished, Each	**$3.00**	**3.00**	**3.25**	**3.25**

Packed in Bulk.

STRUCTURAL WRENCHES

STRAIGHT OPENING

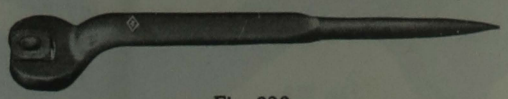

Fig. 326

OFFSET

The tang is for bringing bolt holes into line and for insertion into convenient openings when wrench is not in use, preventing loss and keeping tool in sight. The offset in handle provides for clearance of obstructions and safety for the hands of the operator.

Unfinished wrenches are milled only. Semi-finished wrenches are milled, case-hardened all over; heads not ground.

NOS.	901	902	903	904	905
U. S. S. Nut, Bolt Size, Inch	1/4	5/16	3/8	7/16	1/2
Milled Opening, Inch	17/32	5/8	23/32	13/16	29/32
Length Over All, Inches	8	8	9 1/2	9 1/2	11
Thickness Head, Inch	3/8	3/8	7/16	7/16	1/2
Handle Offset, Inch	13/16	13/16	7/8	7/8	1
Weight Each, Lb.	1/4	1/3	5/6	5/6	1
Unfinished, Each	**$0.33**	**.33**	**.40**	**.40**	**.52**
Semi-finished, Each	**$0.40**	**.40**	**.52**	**.52**	**.70**

NOS.	906	907	908	909	910
U. S. S. Nut, Bolt Size, Inch	9/16	5/8	3/4	7/8	1
Milled Opening, Inches	1	1 7/64	1 19/64	1 1/2	1 11/16
Length Over All, Inches	11	13	15	17	19
Thickness Heads, In.	1/2	9/16	5/8	11/16	3/4
Handle Offset, Inches	1	1 1/8	1 1/4	1 5/16	1 3/8
Weight Each, Lbs.	1 1/4	1 5/6	2 1/2	3 1/2	5
Unfinished, Each	**$0.52**	**.74**	**1.02**	**1.40**	**1.90**
Semi-finished, Each	**$0.70**	**.98**	**1.34**	**1.80**	**2.50**

CONSTRUCTION WRENCHES

15° ANGLE

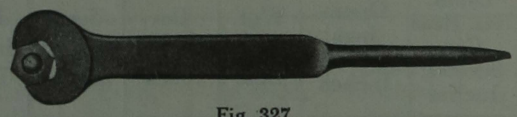

Fig. 327

The tang is for bringing bolt holes into line and for insertion into convenient openings when wrench is not in use, preventing loss and keeping tool in sight.

NOS.	201	202	203	204
U. S. S. Nut, Bolt Size, Inch	1/4	5/16	3/8	7/16
Milled Opening, Inch	1/2	19/32	11/16	25/32
Length Over All, Inches	8	8	9 1/2	11/2
Thickness Heads, Inch	3/8	3/8	7/16	7/16
Weight Each, Lb.	1/2	1/2	2/3	2/3
Unfinished, Each	**$0.28**	**.28**	**.35**	**.35**
Semi-finished, Each	**$0.35**	**.35**	**.45**	**.45**

NOS.	205	206	207	208
U. S. S. Nut, Bolt Size, Inch	1/2	9/16	5/8	3/4
Milled Opening, Inches	7/8	31/32	1 1/16	1 1/4
Length Over All, Inches	11	11	13	15
Thickness Head, Inch	1/2	1/2	9/16	5/8
Weight Each, Lbs.	1	1	1 1/4	2
Unfinished, Each	**$0.45**	**.45**	**.62**	**.86**
Semi-finished, Each	**$0.58**	**.58**	**.80**	**1.10**

NOS.	209	210	211	212
U. S. S. Nut, Bolt Size, Inches	7/8	1	1 1/8	1 1/4
Milled Opening, Inches	1 7/16	1 5/8	1 13/16	2
Length Over All, Inches	17	19	21	21
Thickness Heads, Inch	11/16	3/4	7/8	7/8
Weight Each, Lbs.	3 1/4	4 1/3	6	6
Unfinished, Each	**$1.18**	**1.60**	**2.20**	**2.20**
Semi-finished, Each	**$1.50**	**2.10**	**3.00**	**3.00**

SOCKET WRENCHES

Fig. 328
Straight Pattern with Pin-Handle

SINGLE HEAD—SQUARE OPENING

For Set Screws Square Head, Cap Screws, and U. S. S. Square Nuts.

Made from the best mild steel, drop-forged. Unfinished wrenches only are broached; semi-finished wrenches are broached, edges ground and ccse hardened; finished wrenches are broached, polished all over, case-hardened and lacquered.. Straight pattern hexagon end of shank is designed for use in combination with another wrench or with pin-handle. Wrenches with special broaching, or longer or shorter than in table below, are made to order. Prices on application. Straight pattern listed without pin-handle have no pin-handle hole. Unless otherwise specified, semi-finished wrenches will be supplied.

Fig. 329
Offset Pattern

STRAIGHT PATTERN

NOS.	For Set Scw.; Dia., Ins.	For Cap Scw.; Dia., Ins.	For U. S. S. Nuts; Bolt Size, Ins.	Brchd. Open'g, Ins.	Dia. Head, Ins.	Lgth. Over All, Ins.	Wgt. Each, Lbs.	Unfinished		Semi-finished		Finished	
								With Pin Hdle., Each	No Pin Hdle., Each	With Pin Hdle., Each	No Pin Hdle., Each	With Pin Hdle., Each	No Pin Hdle., Each
960H	1/8	.....	.....	1/8	5/16	3 3/4	1/2	$0.26	$0.18	$0.35	$0.27	$0.44	$0.36
961H	3/16	.....	.....	13/64	1/2	4	1/8	.30	.20	.40	.30	.50	.40
961J	1/4	.....	.....	17/64	1/2	4	1/8	.30	.20	.40	.30	.50	.40
962H	5/16	.....	.....	21/64	5/8	4 1/2	1/4	.33	.22	.44	.33	.55	.44
963H	3/8	1/4	.....	25/64	11/16	4 7/8	1/3	.37	.24	.49	.36	.61	.48
965H	7/16	5/16	.....	29/64	7/8	5 3/4	1/2	.43	.29	.58	.44	.72	.58
966H	1/2	3/8	1/4	33/64	1	6 1/8	1/2	.47	.32	.63	.48	.79	.64
967H	9/16	7/16	.....	37/64	1 1/8	6 1/2	5/8	.53	.36	.71	.54	.89	.72
967X	.....	.....	5/16	39/64	1 1/8	6 1/2	5/8	.53	.36	.71	.54	.89	.72
968H	5/8	1/2	.....	41/64	1 1/4	7	3/4	.57	.40	.77	.60	.97	.80
968P	.....	9/16	3/8	45/64	1 1/4	7	3/4	.57	.40	.77	.60	.97	.80
969H	3/4	5/8	.....	49/64	1 3/8	7 3/8	1	.64	.46	.87	.69	1.10	.92
970X	.....	.....	7/16	51/64	1 1/2	7 7/8	1 1/4	.72	.52	.98	.78	1.24	1.04
971H	7/8	3/4	1/2	57/64	1 5/8	8 1/4	1 1/2	.80	.60	1.10	.90	1.40	1.20
971X	.....	.....	9/16	63/64	1 5/8	8 1/4	1 1/2	.80	.60	1.10	.90	1.40	1.20
973H	1	.....	.....	1 1/64	1 7/8	9 1/8	2 1/2	1.10	.80	1.50	1.20	1.90	1.60
974X	.....	.....	5/8	1 5/64	2	9 1/2	3	1.25	.90	1.70	1.35	2.15	1.80
974H	1 1/8	7/8	.....	1 5/32	2	9 1/2	3	1.25	.90	1.70	1.35	2.15	1.80
976H	1 1/4	1	3/4	1 9/32	2 1/4	10 3/8	4 1/2	1.55	1.15	2.12	1.72	2.70	2.30
977N	.....	1 1/8	.....	1 13/32	2 1/2	10 7/8	6	1.75	1.30	2.40	1.95	3.05	2.60
977X	.....	.....	7/8	1 15/32	2 1/2	10 7/8	6	1.75	1.30	2.40	1.95	3.05	2.60
977P	.....	1 1/4	.....	1 17/32	2 1/2	10 7/8	6	1.75	1.30	2.40	1.95	3.05	2.60
978P	.....	1 3/8	1	1 21/32	2 3/4	11 3/8	7 1/2	2.05	1.60	2.85	2.40	3.65	3.20
979X	.....	.....	1 1/8	1 27/32	3	11 7/8	9	2.60	2.10	3.65	3.15	4.70	4.20
980X	.....	.....	1 1/4	2 1/32	3 5/16	12 1/2	11	3.45	2.80	4.85	4.20	6.25	5.60

OFFSET PATTERN

260H	1/8	.....	.....	1/8	5/16	.....	1/2	$0.18	$.....	$0.27	.....	$0.36	.....
261H	3/16	.....	.....	13/64	1/2	.....	1/8	.20	.....	.30	.....	.40	.....
261J	1/4	.....	.....	17/64	1/2	.....	1/8	.20	.....	.30	.....	.40	.....
262H	5/16	.....	.....	21/64	5/8	3 7/8	1/4	.22	.....	.33	.....	.44	.....
263H	3/8	1/4	.....	25/64	11/16	4 5/16	1/3	.24	.....	.36	.....	.48	.....
265H	7/16	5/16	.....	29/64	7/8	5 7/8	1/2	.29	.....	.44	.....	.58	.....
266H	1/2	3/8	1/4	33/64	1	6 1/4	5/8	.32	.....	.48	.....	.64	.....
267H	9/16	7/16	.....	37/64	1 1/8	6 3/4	5/8	.36	.....	.54	.....	.72	.....
267X	.....	.....	5/16	39/64	1 1/8	6 3/4	3/4	.36	.....	.54	.....	.72	.....
268H	5/8	1/2	.....	41/64	1 1/4	7 1/2	3/4	.40	.....	.60	.....	.80	.....
268P	.....	9/16	3/8	45/64	1 1/4	7 1/2	1	.40	.....	.60	.....	.80	.....
269H	3/4	5/8	.....	49/64	1 3/8	8 3/8	1 1/4	.46	.....	.69	.....	.92	.....
270X	.....	.....	7/16	51/64	1 1/2	9 1/8	1 1/2	.52	.....	.78	.....	1.04	.....
271H	7/8	3/4	1/2	57/64	1 5/8	10	1 1/2	.60	.....	.90	.....	1.20	.....
271X	.....	.....	9/16	63/64	1 5/8	10	1 1/2	.60	.....	.90	.....	1.20	.....
273H	1	.....	.....	1 1/64	1 7/8	11 5/8	2 1/2	.80	.....	1.20	.....	1.60	.....
274X	.....	.....	5/8	1 5/64	2	12 3/8	3	.90	.....	1.35	.....	1.80	.....
274N	1 1/8	7/8	.....	1 5/32	2	12 3/8	3	.90	.....	1.35	.....	1.80	.....
276H	1 1/4	1	3/4	1 9/32	2 1/4	14 7/8	4 1/2	1.15	.....	1.72	.....	2.30	.....
277H	.....	1 1/8	.....	1 13/32	2 1/2	16 1/2	6	1.30	.....	1.95	.....	2.60	.....
277X	.....	.....	7/8	1 15/32	2 1/2	16 1/2	6	1.30	.....	1.95	.....	2.60	.....
277P	.....	1 1/4	.....	1 17/32	2 1/2	16 1/2	6	1.30	.....	1.95	.....	2.60	.....
278P	.....	1 3/8	1	1 21/32	2 3/4	18 1/4	7 1/2	1.60	.....	2.40	.....	3.20	.....
279P	.....	.....	1 1/8	1 27/32	3	20	10	2.10	.....	3.15	.....	4.20	.....
280X	.....	.....	1 1/4	2 1/32	3 5/16	21 3/4	12 1/2	2.80	.....	4.20	.....	5.60	.....

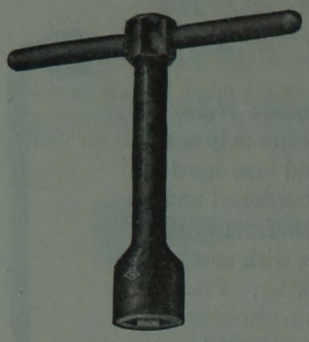

Fig. 330
Straight Pattern with Pin-Handle

SOCKET WRENCHES

SINGLE HEAD—HEXAGON OPENING

For Cap Screws and U. S. Standard Hexagon Nuts

Made from the best mild steel, drop-forged. Unfinished wrenches only are broached. Semi-finished wrenches are broached, edges ground and case hardened. Finished wrenches are broached, polished all over, case hardened and lacquered. Straight pattern hexagon end of shank is designed for use in combination with another wrench or with pin-handle. Wrenches with special broaching or longer or shorter than in table below are made to order. Prices on application.

Straight pattern listed without pin-handle have no pin-handle hole. Unless otherwise specified semi-finished wrenches will be supplied.

Fig. 331
Offset Pattern

STRAIGHT PATTERN

NOS.	For U. S. S. Nuts; Bolt Size, Ins.	For Cap Screws; Diam., Ins.	Broached Opening, Ins.	Diam. Head, Ins.	Lgth. Over All, Ins.	Wgt. Each, Lbs.	Unfinished		Semi-finished		Finished	
							No Pin Handle, Each	With Pin Handle, Each	No Pin Handle, Each	With Pin Handle, Each	No Pin Handle, Each	With Pin Handle, Each
961A	1/8	...	21/64	1/2	4	1/2	$0.20	$0.30	$0.30	$0.40	$0.40	$0.50
962D	...	3/16	25/64	5/8	4 1/2	1/8	.22	.33	.33	.44	.44	.55
963A	3/16	...	27/64	11/16	4 7/8	1/8	.24	.37	.36	.49	.48	.61
963D	...	1/4	29/64	11/16	4 7/8	1/4	.24	.37	.36	.49	.48	.61
964A	1/4	5/16	33/64	3/4	5 1/4	1/3	.26	.39	.39	.52	.52	.65
965D	...	3/8	37/64	7/8	5 3/4	1/2	.29	.43	.44	.58	.58	.72
965A	5/16	...	39/64	7/8	5 3/4	1/2	.29	.43	.44	.58	.58	.72
966D	...	7/16	41/64	1	6 1/8	5/8	.32	.47	.48	.63	.64	.79
967A	3/8	...	45/64	1 1/8	6 1/2	5/8	.36	.53	.54	.71	.72	.89
967D	...	1/2	49/64	1 1/8	6 1/2	3/4	.36	.53	.54	.71	.72	.89
968A	7/16	...	51/64	1 1/4	7	3/4	.40	.57	.60	.77	.80	.97
968D	...	9/16	53/64	1 1/4	7	1	.40	.57	.60	.77	.80	.97
969A	1/2	5/8	57/64	1 3/8	7 3/8	1 1/4	.46	.64	.69	.87	.92	1.10
970A	9/16	...	63/64	1 1/2	7 7/8	1 1/2	.52	.72	.78	.98	1.04	1.24
970D	...	3/4	1 1/64	1 1/2	7 7/8	2 1/2	.52	.72	.78	.98	1.04	1.24
971A	5/8	...	1 5/64	1 5/8	8 1/4	3	.60	.80	.90	1.10	1.20	1.40
971D	...	7/8	1 5/32	1 5/8	8 1/4	3	.60	.80	.90	1.10	1.20	1.40
973A	3/4	1	1 9/32	1 7/8	9 1/8	4 1/2	.80	1.10	1.20	1.50	1.60	1.90
974D	...	1 1/8	1 13/32	2	9 1/2	6	.90	1.25	1.35	1.70	1.80	2.15
975A	7/8	...	1 15/32	2 1/8	10	6	1.00	1.35	1.50	1.85	2.00	2.35
975D	...	1 1/4	1 17/32	2 1/8	10	6	1.00	1.35	1.50	1.85	2.00	2.35
976A	1	...	1 21/32	2 1/4	10 3/8	6	1.15	1.55	1.72	2.12	2.30	2.70
977A	1 1/8	...	1 27/32	2 1/2	10 7/8	7 1/2	1.30	1.75	1.95	2.40	2.60	3.05
978A	1 1/4	...	2 1/32	2 3/4	11 3/8	7 1/2	1.60	2.05	2.40	2.85	3.20	3.65
979A	1 3/8	...	2 7/32	3	11 7/8	9	2.10	2.60	3.15	3.65	4.20	4.70
980A	1 1/2	...	2 13/32	3 5/16	12 1/2	11	2.80	3.45	4.20	4.85	5.60	6.25

OFFSET PATTERN

261A	1/8	...	21/64	1/2	...	1/2	$0.20	...	$0.30	...	$0.40	...
262D	...	3/16	25/64	5/8	3 7/8	1/8	.22	...	.33	...	.44	...
263A	3/16	...	27/64	1 1/16	4 5/16	1/8	.24	...	.36	...	.48	...
263D	...	1/4	29/64	1 1/16	4 5/16	1/4	.24	...	.36	...	.48	...
264A	1/4	5/16	33/64	3/4	5 1/8	1/3	.26	...	.39	...	.52	...
265D	...	3/8	37/64	7/8	5 7/8	1/2	.29	...	.44	...	.58	...
265A	5/16	...	39/64	7/8	5 7/8	1/2	.29	...	.44	...	.58	...
266D	...	7/16	41/64	1	6 1/4	5/8	.32	...	.48	...	.64	...
267A	3/8	...	45/64	1 1/8	6 3/4	5/8	.36	...	.54	...	.72	...
267D	...	1/2	49/64	1 1/8	6 3/4	3/4	.36	...	.54	...	.72	...
268A	7/16	...	51/64	1 1/4	7 1/2	3/4	.40	...	.60	...	.80	...
268D	...	9/16	53/64	1 1/4	7 1/2	1	.40	...	.60	...	.92	...
269A	1/2	5/8	57/64	1 3/8	8 3/8	1 1/4	.46	...	.69	...	.80	...
270A	9/16	...	63/64	1 1/2	9 1/8	1 1/2	.52	...	.78	...	1.04	...
270D	...	3/4	1 1/64	1 1/2	9 1/8	1 1/2	.52	...	.78	...	1.04	...
271A	5/8	...	1 5/64	1 5/8	10	2 1/2	.60	...	.90	...	1.20	...
271D	...	7/8	1 5/32	1 5/8	10	3	.60	...	.90	...	1.20	...
273A	3/4	1	1 9/32	1 7/8	11 5/8	3	.80	...	1.20	...	1.60	...
274D	...	1 1/8	1 13/32	2	12 3/8	4 1/2	.90	...	1.35	...	1.80	...
275A	7/8	...	1 15/32	2 1/8	13 1/4	6	1.00	...	1.50	...	2.00	...
275D	...	1 1/4	1 17/32	2 1/8	13 1/4	6	1.00	...	1.50	...	2.00	...
276A	1	...	1 21/32	2 1/4	14 7/8	6	1.15	...	1.72	...	2.30	...
277A	1 1/8	...	1 27/32	2 1/2	16 1/2	6	1.30	...	1.95	...	2.60	...
278A	1 1/4	...	2 1/32	2 3/4	18 1/4	7 1/2	1.60	...	2.40	...	3.20	...
279A	1 3/8	...	2 7/32	3	20	10	2.10	...	3.15	...	4.20	...
280A	1 1/2	...	2 13/32	3 5/16	21 3/4	12 1/2	2.80	...	4.20	...	5.60	...

SOCKET WRENCH SETS

MOSSBERG

Composed entirely of pressed steel which has the necessary toughness and strength and at the same time require but little space to operate. The extensions, universal joints and reversible ratchet handles make any nut easily accessible. All Parker Rust Proof black finish.

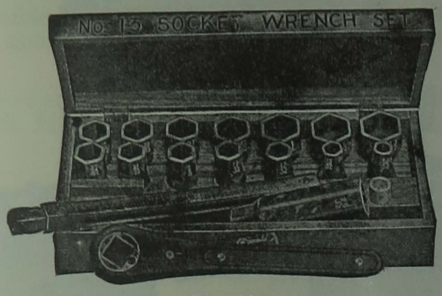

Fig. 332

For service station, light mill and automobile reconstruction work.

Set Consists of—

One No. 355 Ratchet Socket Wrench Handle; One No. 351 Extension Bar, 9½ Inches long; One Spark Plug Socket Wrench, 4 Inches long, 29/32 Inch in Diameter. Fifteen Sockets, ranging in size from 13/32 Inch to 1 3/32 Inches.

Per Set

NO. 13—Weight, 6 Lbs. **$5.50**

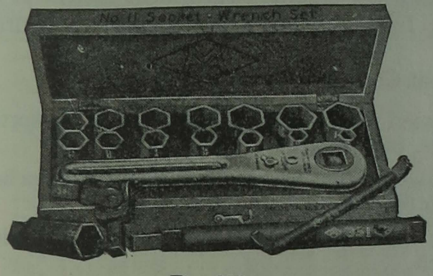

Fig. 333

For service station, garage and machine construction work.

Set Consists of—

One No. 350 Ratchet Socket Wrench Handle. One No. 351 Extension Bar, 9½ Inches long. One No. 336 Universal Joint. One No. 101 Offset Screw Driver. Fifteen Sockets, ranging in size from 13/32 to 1 3/32 Inches.

Per Set

NO. 11—Weight, 6 Lbs. **$7.50**

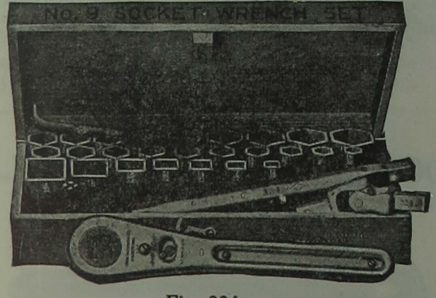

Fig. 334

For factory and machinists' use.

Set Consists of—

One No. 350 Ratchet Socket Wrench Handle; One No. 351 Extension Bar, 9½ Inches long; One No. 336 Universal Joint; One Double End Offset Screw Driver; Twenty-six Sockets, ranging in size from 13/32 to 1 3/32 Inches.

Per Set

NO. 9—Weight, 8½ Lbs. **$10.00**

All Above, One Set in a Varnished Hardwood Box

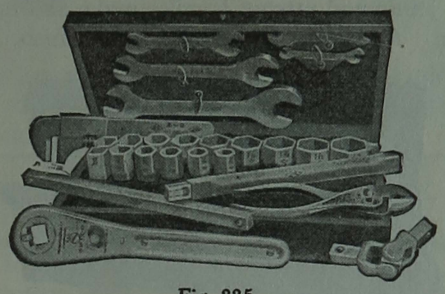

Fig. 335

An excellent arrangement of tools for mill work, service station, factory and garage usage.

Set Consists of—

One No. 350 Ratchet Socket Wrench Handle. One No. 351 Tubular Extension Bar, 9½ Inches long. One No. 336 Universal Joint. One No. 346 Solid Extension Bar, 9½ Inches long. One No. K8 Adjustable, all Steel Monkey Wrench, 8 Inches long. One pair No. 100 Pliers, Slip Joint, Knurled Handle, 6 Inches long. One No. 1 Set General Service Engineers' Wrenches, with following openings, ¼, 5/16, 3/8, 7/16, ½, 9/16, 5/8, ¾, 7/8, 1 Inch. Sixteen Sockets, ranging in size from 15/32 to 1 3/32 Inches.

Per Set

NO. 26—Weight, 10½ Lbs. **$11.00**

Fig. 336

A complete wrench and tool kit for general use in factories, shops, and particularly for garages.

Set Consists of—

One No. 350 Ratchet Wrench and Extension Bar. One Take Down Handle and Extension Bar. One No. 320 Offset Socket Wrench. One No. 100 Sterling Finest Nickeled Universal Slip Joint Plier. One No. 1 General Service Double End Wrench Set, extra finished. Ten different openings. One Universal Joint. Three Spark Plug Sockets, Sizes 29/32, 1 1/32, 1 5/32 Inches. Three Screw driver Bits. One Cotter Pin Extractor. Thirty-three Hexagon Sockets from 12/32 to 1 3/32 Inches. Eleven Square Sockets from 12/32 to 1 3/32 Inches. Size of Box, 15¼ Inches x 9¾ Inches.

Per Set

NO. 14—Weight of Set, including Box, 16½ Lbs. **$17.00**

All Above, One Set in a Varnished Hardwood Box

SOCKET WRENCH SETS

MOSSBERG

Sockets are composed entirely of pressed steel which has the necessary toughness and strength, and at the same time require but little space to operate. The extensions, universal joints and ratchet handles make any nut easily accessible. All Parker Rust Proof black finish.

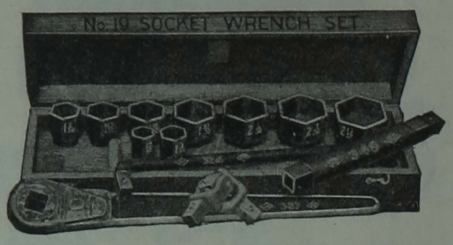

Fig. 337

HEAVY DUTY

An excellent wrench set for auto truck service, bridge builders, shipyards, structural steel and other large-sized construction work.

Set Consists of:

One No. 357 Ratchet Socket Wrench Handle, 18 Inches long; One No. 324 Offset Socket Wrench Handle; One No. 348 Extension Tube, 10 Inches long; One No. 337 Universal Joint; One No. 338 Connection Bushing (for use with small series sockets); Nine Heavy Duty, Hexagon Sockets, from 29/32 to 2 13/32 Inches.

	Per Set
NO. 19—Weight, 19 Lbs.	$20.00

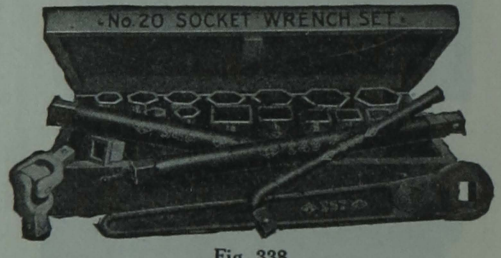

Fig. 338

HEAVY DUTY

An excellent socket wrench set for structural steel companies, steamship builders, railroad construction and bridge erectors.

Set Consists of:

One No. 357 Ratchet Wrench Handle, 18 Inches long; One No. 324 Offset Socket Wrench Handle; One No. 347 2½-Inch Extension Tube; One No. 348 10-Inch Extension Tube; One No. 349 18-Inch Extension Tube; One No. 337 Universal Joint; One No. 338 Connection Bushing; Nine Heavy Hexagon Sockets, from 29/32 to 2 13/32 Inches; Six Heavy Sockets, from 29/32 to 2 1/32 Inches. Size of Box, 4½x9½x21 Inches.

	Per Set
NO. 20—Weight, 24½ Lbs.	$25.00

All Above, One Set in a Hardwood Box

SOCKET WRENCH CHEST

MOSSBERG

Fig. 339

This assortment of sockets and handles has been carefully made up based on one year's record of sales, and the quantity of each unit is in direct proportion to demand. Empty kits are included in assortment as containers for special sets made up from this stock.

Chest is an excellent finished store fixture made of selected chestnut carefully varnished. Height 14¾ Inches, width 21 Inches, depth 12½ Inches; eight drawers.

Assortment Consists of:

300—Pressed Steel Sockets, Rust Proof, assorted sizes, per Dozen	$2.20
21—Pressed Steel Spark Plug Socket Wrenches, assorted, Each	.40
4—No. 350 Reverse Ratchet Socket Handles, Each	2.50
4—No. 355 Ratchet Handles, Each	1.25
4—No. 322 Double End Offset and Vertical Handles, Each	.35
4—No. 340 Take-down T Handles, Each	.60
4—No. 351 Extension Tubes, Each	.60
4—No. 336 Universal Joints, Each	.55
5—Canvas Tool Rolls, Circulars, etc.	No Charge

	Each
NO. 300—Chest with assortment listed, Complete; Weight, 130 Lbs.	$95.00

SOCKET WRENCH HANDLES

RATCHET

Fig. 340

Ratchet is reversible. Made of highest quality steel. Full nickel-plate finish. Opening will fit any standard socket extension bar.

	Each
NO. 350—Length Over All, 10 Inches; Weight, 1¼ Lbs.	$2.50

SOCKET WRENCH HANDLES

RATCHET

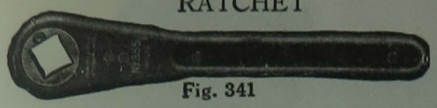

Fig. 341

Reversible by merely turning wrench over. Made from highest quality steel; Parker rust proof black finish.

Each

NO. 355—Length Over All, 8 Inches; Weight Each, ¾ Lb..... $1.25

SOCKET WRENCHES

Fig. 342

SOLID T HANDLE
HEAVY DUTY

Sockets are drawn from strip steel, case hardened, and securely fastened to ½ inch bar steel handles. Rust proof black finish.

SHORT HANDLE

NOS.	Sizes, Hex. Sockets, Inch	U. S. Stand. Bolt Sizes, Inch	Mfg. Stand. Head, Inch	Mfg. Stand. Nut, Inch	S.A.E. Stand. Screws, Inch	Hex. Head Cap Screws, Inch
1129	29/64	.....	.....	1/4	1/4	1/4
1133	33/64	1/4	.....	.....	5/16	5/16
1137	37/64	.....	3/8	.....	3/8	3/8
1139	39/64	5/16	.....	.....	.....	.....
1141	41/64	.....	.....	3/8	7/16	7/16
1145	45/64	3/8	.....	.....	.....	.....
1149	49/64	.....	1/2	.....	1/2	1/2
1151	51/64	7/16	.....	.....	.....	.....
1153	53/64	.....	.....	1/2	.....	9/16
1157	57/64	1/2	.....	.....	9/16	5/8
1161	61/64	.....	5/8	.....	5/8	.....
1163	63/64	9/16	.....	.....	.....	.....
1165	1 1/64	.....	.....	5/8	11/16	3/4
1169	1 5/64	5/8	.....	.....	3/4	.....
1181	1 17/64	3/4	.....	.....	7/8	1

Length Over All, Inches..... 6
Weight Each, Lb..... 3/4
Each..... $0.72

LONG HANDLE

NOS.	Sizes, Hex. Sockets, Inch	U.S. Stand. Bolt Sizes, Inch	Mfg. Stand. Head, Inch	Mfg. Stand. Nut, Inch	S.A.E. Stand. Screws, Inch	Hex. Head Cap Screws, Inch
1329	29/64	.....	.....	1/4	1/4	1/4
1333	33/64	1/4	.....	.....	5/16	5/16
1337	37/64	.....	3/8	.....	3/8	3/8
1339	39/64	5/16	.....	.....	.....	.....
1341	41/64	.....	.....	3/8	7/16	7/16
1345	45/64	3/8	.....	.....	.....	.....
1349	49/64	.....	1/2	.....	1/2	1/2
1351	51/64	7/16	.....	.....	.....	.....
1353	53/64	.....	.....	1/2	.....	9/16
1357	57/64	1/2	.....	.....	9/16	5/8
1361	61/64	.....	5/8	.....	5/8	.....
1363	63/64	9/16	.....	.....	.....	.....
1365	1 1/64	.....	.....	5/8	11/16	3/4
1369	1 5/64	5/8	.....	.....	3/4	.....
1381	1 17/64	3/4	.....	.....	7/8	1

Length Over All, Inches..... 12
Weight Each, Lb..... 1
Each..... $0.78

All Above, Six in a Carton

SOCKET WRENCHES

OFFSET—SINGLE END

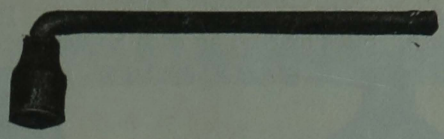

Fig. 343

Sockets are drawn from flat stock, case hardened, and fastened to handles made from ½ inch bar steel, rust proof black finish.

NOS.	Sizes, Hex. Sockets, Inch	U. S. Nuts Bolt Sizes, Inch	Mfg. Stand. Head, Inch	Mfg. Stand. Nut, Inch	S.A.E. Stand. Screws, Inch	Hex. Head Cap Screws, Inch
1529	29/64	.....	.....	1/4	1/4	1/4
1533	33/64	1/4	.....	.....	5/16	5/16
1537	37/64	.....	3/8	.....	3/8	3/8
1539	39/64	5/16	.....	.....	.....	.....
1541	41/64	.....	.....	3/8	7/16	7/16
1545	45/64	3/8	.....	.....	.....	.....
1549	49/64	.....	1/2	.....	1/2	1/2
1551	51/64	7/16	.....	.....	.....	.....
1553	53/64	.....	.....	1/2	.....	9/16
1557	57/64	1/2	.....	.....	9/16	5/8
1561	61/64	.....	5/8	.....	5/8	.....
1563	63/64	9/16	.....	.....	.....	.....
1565	1 1/64	.....	.....	5/8	11/16	3/4
1569	1 5/64	5/8	.....	.....	3/4	.....
1581	1 17/64	3/4	.....	.....	7/8	1

Length Over All, Inches..... 10
Weight Each, Lb..... 3/4
Each..... $0.56

VALVE SPRING LIFTERS

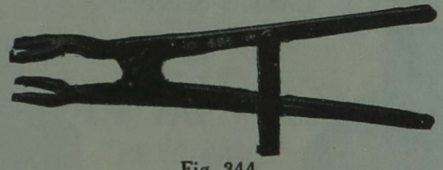

Fig. 344

No. 655

Ratchet holds valve firmly in position; allowing use of both hands. Spring attachment allows instant release. Pressed steel construction. Parker rust proof finish.

Each

NO. 655—Length Over All, 12 Inches; Weight Each, 1¼ Lbs..... $1.40

VALVE GRINDERS

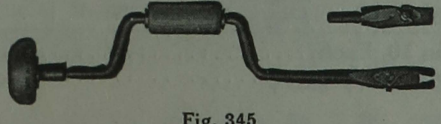

Fig. 345

No. 610

An adjustable Valve Grinder. Will fit valve tops on all cars, whether slotted or drilled with two holes. Dull nickel-plate finish.

Each

NO. 610—Length Over All, 22 Inches; Weight Each, 1 Lb..... $1.00

Six in a Carton

SOCKETS

FOR RATCHET HANDLES

Sockets are cold drawn from flat steel. Black rust proof finish. Sizes marked on each Socket.

SMALL SERIES

Fig. 346

Fig. 347

HEXAGON

NOS.	Openings, Inch	NOS.	Openings, Inch	NOS.	Openings, Inches
110	5/16	119	19/32	128	7/8
111	11/32	120	5/8	129	29/32
112	3/8	121	21/32	130	15/16
113	13/32	122	11/16	131	31/32
114	7/16	123	23/32	132	1
115	15/32	124	3/4	133	1 1/32
116	1/2	125	25/32	135	1 3/32
117	17/32	126	13/16	137	1 5/32
118	9/16	127	27/32	141	1 9/32

Less Than 10, Each..... $0.35
10 or More, Each..... $0.20

SQUARE

NOS.	Openings, Inch	NOS.	Openings, Inch	NOS.	Openings, Inches
163	13/32	171	21/32	183	1 1/32
165	15/32	173	23/32	187	1 5/32
167	17/32	175	25/32	191	1 9/32
169	19/32	179	29/32		

Less Than 10, Each..... $0.35
10 or More, Each..... $0.20

LARGE SERIES

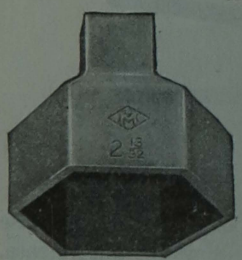

Fig. 348

Fig. 349

HEXAGON

NOS.	Openings, Inches	NOS.	Openings, Inches
0129	29/32	0159	1 27/32
0135	1 3/32	0165	2 1/32
0141	1 9/32	0171	2 7/32
0147	1 15/32	0177	2 13/32
0153	1 21/32		

Less Than 10, Each..... $0.70
10 or More, Each..... $0.55

SQUARE

NOS.	Openings, Inches	NOS.	Openings, Inches	NOS.	Openings, Inches
S0129	29/32	S0141	1 9/32	S0153	1 21/32
S0135	1 3/32	S0147	1 15/32	S0165	2 1/32

Less Than 10, Each..... $0.70
10 or More, Each..... $0.55

All Above, One Dozen in a Box

SPARK PLUG WRENCHES

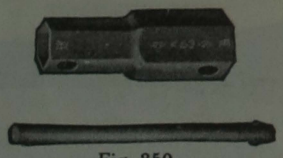

Fig. 350

DOUBLE END

Hardened pressed steel, mottled finish; in sizes to fit hexagon or square nuts, set screws and bolt heads; are standard and will fit nearly every make of Socket Wrench; sizes given are the opening in Sockets measured from flat to flat. With wire handle.

NOS	453	458
Openings, Inches	29/32 x 31/32	1 1/32 x 1 5/32
Length Over All, Inches	4	4
Weight Each, Lb	3/4	3/4
Each	$0.40	0.40

SOCKET WRENCHES

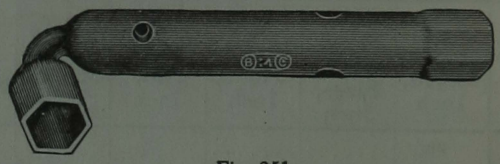

Fig. 351

OFFSET PATTERN

Made from seamless steel tubing; hand forged. One piece tool.

NO. 20—For Deep and Close Offset

Size NOS.	U. S. S. Hex. Nuts, Inch	U. S. S. Hex. Cap Screws, Inch	Openings, Inch	Weight Dozen, Lbs.	Per Dozen
06	3/16	.....	13/32	4 1/2	$4.84
6	.....	1/4	7/16	5	4.84
7	1/4	5/16	1/2	5 1/2	5.96
8	.....	3/8	9/16	8 1/2	7.32
9	5/16	7/16	5/8	9 1/2	8.66
10	3/8	.....	11/16	9 1/2	9.20
11	.....	1/2	3/4	10 1/2	9.45
12	7/16	9/16	13/16	10 1/2	10.00
13	1/2	5/8	7/8	12 1/2	10.80
14	9/16	.....	15/16	12 1/2	10.80

One-half Dozen in a Box

Fig. 352

WITH BIT BRACE SHANKS

Hand forged; black finish; furnished with square or hexagon openings.

Size, Inch	1/4	5/16	3/8	7/16
Weight per Dozen, Lbs.	2	2 1/2	3	3 1/2
Per Dozen	$3.00	3.50	4.00	5.00
Size, Inch	**1/2**	**9/16**	**5/8**	**3/4**
Weight per Dozen, Lbs.	4	4 1/2	5	5 1/2
Per Dozen	$6.00	6.50	7.00	8.40

One-quarter Dozen in a Box

RATCHET WRENCHES
REVERSIBLE

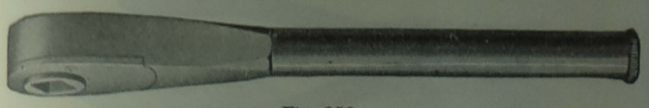

Fig. 353

Designed for extra hard service. Gears can be changed to take any size nut within the capacity of the wrench. Drop forged from highest grade tool steel. Gears hardened and polished. Black finish.

Note.—In ordering wrenches state size and shape (square or hexagon) of hole wanted.

NOS.	Length Handle, Inches	Opening, Inches		Weight Each, Lbs.	With One Gear, Each
		Square	Hexagon		
1	10	3/8- 5/8	5/8- 3/4	2	$5.00
2	12	1/2- 3/4	3/4-1	3 1/2	6.00
3	15	5/8-1 1/8	1 -1 1/4	4 1/2	8.00
3 1/2	18	5/8-1 1/8	1 -1 1/4	5 1/4	9.00
4	18	1 -1 1/2	1 1/4-1 3/4	9 1/2	10.00
4 1/2	24	1 -1 1/2	1 1/4-1 3/4	11	12.00

SOCKETS OR GEARS
HEXAGON

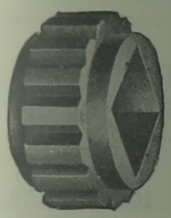

Fig. 354

	Each
NO. 1—5/8-3/4 Inch	$1.00
NO. 2—3/4-7/8-1 Inch	1.00
NO. 3—1-1 1/16-1 1/8-1 1/4 Inch	1.25
NO. 4—1 1/4-1 1/16-1 5/8-1 3/4 Inch	1.50

SQUARE

NO. 1—3/8-1/2-5/8 Inch	1.00
NO. 2—1/2-5/8-3/4 Inch	1.00
NO. 3—5/8-3/4-7/8-1-1 1/16-1 1/8	1.25
NO. 4—1-1 1/8-1 1/4-1 3/8-1 1/2 Inch	1.50

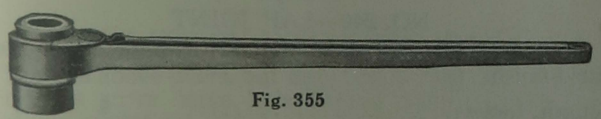

Fig. 355

Especially designed for bridge and structural work where a strong wrench is desired. Drop forged, hardened; black finish. Will turn nuts on or off without removing the wrench.

NOS.	1	2	3
Length Handle, Feet	2	3	3
Size Hole through Socket, Inches	1 1/8	1 3/4	2 1/2
Take Socket, Square or Hexagon, Inches	1 to 2	2 to 3 1/8	3 1/8 to 5
Weight Each, Lbs.	10	23	50
Each, with One Socket	$10.00	18.00	24.00

EXTRA SOCKETS OR GEARS

Fig. 356

	Each
NO. 1—Square or Hexagon	$2.00
NO. 2—Square or Hexagon	4.00
NO. 3—Square or Hexagon	8.00

RATCHET WRENCHES
REVERSIBLE

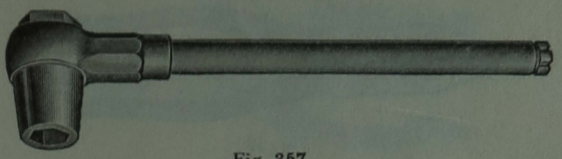

Fig. 357

The head and socket of this wrench is of drop forged steel. Handle, cold-drawn steel tubing. One socket is furnished with each wrench.

NOS.	171	172	173	174
Length Handle, Inches.	10	14	16	18
Capacity, Inches	1/4 to 5/8	3/8 to 7/8	1/2 to 1 1/8	5/8 to 1 1/2
Weight Each, Lbs.	3	5	6	9
Each, with One Socket.	$4.75	5.50	6.50	7.50

NOS.	175	176	177
Length Handle, Inches	22	24	28
Capacity, Inches	5/8 to 1 1/2	5/8 to 1 1/2	5/8 to 1 1/2
Weight Each, Lbs.	10	10 1/4	10 1/2
Each, with One Socket	$7.75	8.00	8.50

Note.—Sockets adaptable to the different sizes of wrenches are listed below.

EXTRA SOCKETS

Fig. 358

NOS.	171	172	173	174 to 177
Size Bolt, Hex. or Sq., Inches	1/4 to 5/8	1/8 to 7/8	1/2 to 1 3/8	3/4 to 1 1/2
Each	$1.75	2.00	2.50	3.00

Note.—Order by bolt sizes and state whether for square or hexagon nuts.

RATCHET TAP WRENCHES
REVERSIBLE

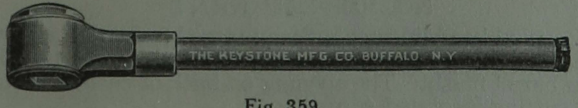

Fig. 359

Adapted for machine shops, builders of machinery; boiler shops, for use on stay bolts, flue expanders, etc.; also for plumbers, steam fitters, gas and water main tapping machines.

All sockets are made from solid steel.

NOS.	61	61A	62	63
Length Handle, Inches	10	14	14	16
Weight Each, Lbs.	2 1/4	4	4	4 1/2
Sq. Hole in Socket, Inch.	5/8	3/4	7/8	1
Each	$4.25	5.00	5.00	5.75

NOS.	64	65	66	67
Length Handle, Inches	18	22	24	28
Weight Each, Lbs.	7 1/2	8 1/4	8 1/2	9 1/4
Sq. Hole in Socket, Inches	1 1/8	1 1/8	1 1/8	1 1/8
Each	$6.50	6.75	7.00	7.50

EXTRA SOCKETS

NOS.	61	61A	62	63	64 to 67
Sq. Hole in Socket, Ins.	5/8	3/4	7/8	1	1 1/8
Each	$1.25	1.50	1.50	1.75	2.00

SIDE CUTTING PLIERS
PEXTO

Fig. 360

NO. 30—BOX JOINT

Forged from highest grade crucible steel, oil tempered; heavy star rivet at joint; polished jaws; gun barrel finish knurled handles.

Length, Inches		5	6
Weight per Dozen, Lbs.		2½	5
Per Dozen		$12.50	13.50
Length, Inches	7	8	9
Weight per Dozen, Lbs.	7½	10½	15
Per Dozen	$17.00	20.00	35.00

Fig. 361

NO. 300—BOX JOINT

Same as No. 30, but with handles insulated. The insulation on these pliers is tested to insulate against a current of 2,500 volts. The insulation covering is not brittle and will not flake off.

Length, Inches	6	7	8
Weight per Dozen, Lbs.	6	8	12
Per Dozen	$24.50	29.25	34.00

Fig. 362

NO. 500—LAP JOINT

Beveled head linemen's pliers: forged from special crucible steel, finely tempered; polished jaws; knurled handles, gun barrel finish. The opening on back of cutters is large for cutting insulated wire.

Length, Inches	6	7	8	9
Weight per Dozen, Lbs.	6	9	14	13¼
Per Dozen	$11.00	13.50	15.75	23.00

Fig. 363

NO. 5000—LAP JOINT

Same as No. 500, but with handles covered with Xite insulation. Adapted for use of linemen motor repair men and electricians.

Length, Inches	6	7	8
Weight per Dozen, Lbs.	7	10	15½
Per Dozen	$20.00	22.25	24.50

One-twelfth Dozen in Carton
One-half Dozen Cartons in a Box

SIDE CUTTING PLIERS
PEXTO

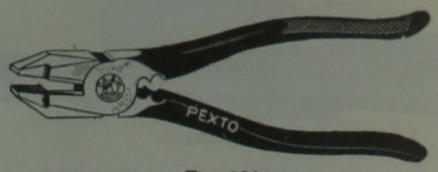

Fig. 364

NO. 50—LAP JOINT

Beveled head linemen's pliers with sleeve twister. Forged from special crucible steel, finely tempered; polished jaws; knurled handles, gun barrel finish.

Length, Inches	6	7	8
Weight per Dozen, Lbs.	6	9	14
Per Dozen	$11.00	13.00	15.75

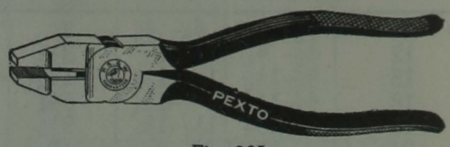

Fig. 365

NO. 40—LAP JOINT

Forged from highest grade crucible steel; finely tempered and finished; raised cutters; polished head; knurled handles, gun barrel finish.

Length, Inches		4	5
Weight per Dozen, Lbs.		2	2½
Per Dozen		$7.00	7.30
Length, Inches	6	7	8
Weight per Dozen, Lbs.	5	6½	10½
Per Dozen	$7.90	10.00	11.75

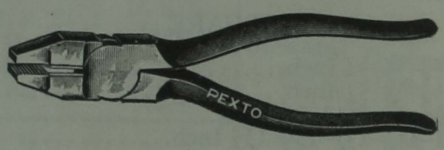

Fig. 366

NO. 240—LAP JOINT

Similar to No. 40 pliers, but with smooth handles, blued finish.

Length, Inches		4	5
Weight per Dozen, Lbs.		2	2½
Per Dozen		$4.90	5.60
Length, Inches	6	7	8
Weight per Dozen, Lbs.	5	6½	10½
Per Dozen	$6.90	8.50	10.50

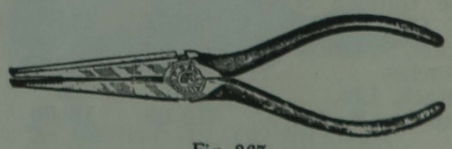

Fig. 367

NO. 62—LONG REACH—SQUARE NOSE

Forged from high grade crucible steel; polished jaws with side cutters; lap joint. Used by electricians, jewellers, opticians, etc. Gun barrel finish handle.

Length, Inches	6½
Weight per Dozen, Lbs.	3
Per Dozen	$14.00

One-twelfth Dozen in Carton
One-half Dozen Cartons in a Box

LINEMEN'S PLIERS

SIDE CUTTING
KLEIN'S

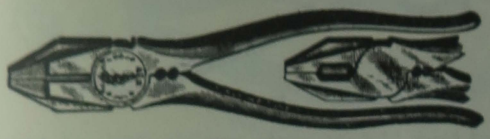

Fig. 368

POR USE ON BARE WIRE

Forged from special tool steel, carefully machined and fitted, finely tempered; polished heads; black handles, shaped to the curvature of the hand; powerful leverage and keen re-inforced cutting knives. Especially adapted for heavy cutting in telephone and telegraph work.

NOS.	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
201-5	5	3	$16.75
201-6	6	5	20.85
201-7	7	7½	25.00
201-8	8	12	30.00
201-9	9	12½	33.35
201-10	10	18	36.75

With Sleeve Joint Twister

NOS.	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
212-6	6	5	$24.00
212-7	7	7½	28.00
212-8	8	12	32.00
212-9	9	13	36.00

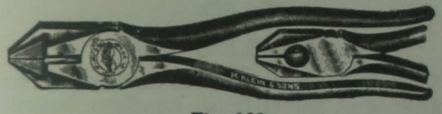

Fig. 369

FOR USE ON INSULATED WIRE

Same as above pliers, but designed for use on insulated wire; has extra large hole behind knives to prevent pinching insulation.

NOS.	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
200-5	5	3	$16.75
200-6	6	5	20.85
200-7	7	7½	25.00
200-8	8	12	30.00
200-9	9	13	33.35
200-10	10	18	36.75

With Sleeve Joint Twister

NOS.	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
213-6	6	5	$24.00
213-7	7	7½	28.00
213-8	8	12	32.00
213-9	9	13	36.00

All Above, One-twelfth Dozen in a Carton
One-half Dozen Cartons in a Box

COMBINATION PLIERS

PEXTO

Fig. 370

Combined side cutting; buttons and burner pliers; forged from high grade tool steel. Screw driver and reamer on handles. Polished heads; handles, gun barrel finish.

NO. 70

Length, Inches	5½	6	7	8
Weight per Dozen, Lbs.	3¾	5¾	9½	11½
Per Dozen	$9.50	10.00	11.35	13.35

DIAGONAL CUTTING PLIERS

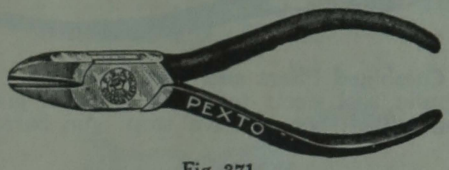

Fig. 371

Forged from the highest grade crucible steel; box joint; polished jaws; handles gun barrel finish.

NO. 27

Length, Inches	4½	5	6
Weight per Dozen, Lbs.	1¼	2	4
Per Dozen	$9.75	10.25	12.50

WEAVERS' PLIERS

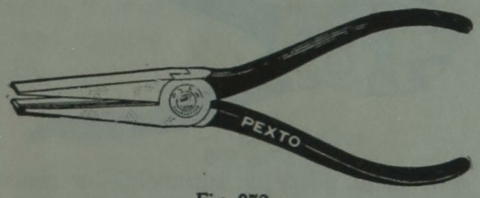

Fig. 372

Forged from highest grade steel; lap joint; concave and convex nose; polished head and jaws, gun barrel finish handles.

NO. 68

Length, Inches	5½
Jaws, Inches	1⅞
Weight per Dozen, Lbs.	3¼
Per Dozen	$10.00

Fig. 373

Forged from crucible steel; lap joint; oil tempered; polished head and jaws; blued finish handles; file jaws; heavy rivets.

NO. 42

Length, Inches	5½	6½
Jaws, Inches	1¾	2⅜
Weight per Dozen, Lbs.	2	3
Per Dozen	$6.10	7.25

All Above, One-twelfth Dozen in a Carton
One-half Dozen Cartons in a Box

CURVED NOSE PLIERS

Fig. 374

Forged from the best refined steel; carefully tempered and accurately designed; has a long curved spring tempered nose adaptable for assembling jigs, electrical apparatus, typewriters, etc. Gun barrel finish.

	Per Dozen
NO. 67—Lengths, 5½ Inches. Weight per Dozen, 2¾ Lbs.	$11.50

BUTTON'S PLIERS

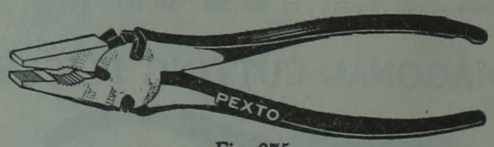

Fig. 375

Combined Pliers and Wire Cutters

High grade tool steel; tempered polished jaws; flat nose; jaws milled; has positive stop; gun barrel finish handles.

NO. 90

Length, Inches	4½	6	8
Weight per Dozen, Lbs.	3	6	9
Per Dozen	$3.25	3.65	4.70
Length, Inches	9	10	12
Weight per Dozen, Lbs.	12	14	25
Per Dozen	$5.50	6.10	7.60

SLIP JOINT PLIERS

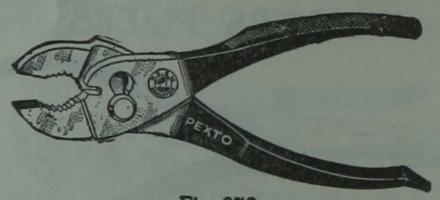

Fig. 376

Most convenient pliers for automobile or general use; forged from high grade steel, tempered; wire cutter between jaws; adjustable joint for large or small work; milled jaws; handles knurled.

Made with polished head and gun barrel finish handle or full nickel plated.

NO. 5

Length, Inches	6	8	10
Weight per Dozen, Lbs.	6	8	12
Polished Head and Gun Barrel Handles, per Dozen	$5.00	6.10	7.25
Full Nickel Plated, per Dozen	$6.10	7.25	8.50

COMBINATION PLIERS

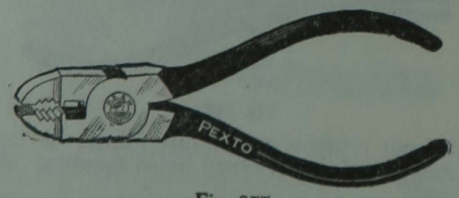

Fig. 377

LAP JOINT

Combination side cutting and burner pliers; polished, gun barrel finish handles.

NO. 75

Length, Inches	5
Weight per Dozen, Lbs.	3
Per Dozen	$7.60

BURNER PLIERS

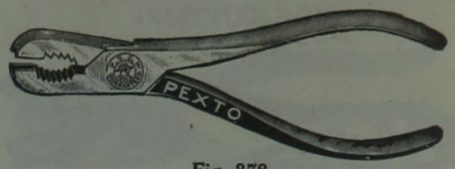

Fig. 378

Forged from highest grade crucible steel, oil tempered; full polished handles; heavy rivet at joint; milled teeth.

NO. 3

Length, Inches	5	6	7
Weight per Dozen, Lbs.	3¼	4¼	5½
Per Dozen	$3.05	3.50	4.10

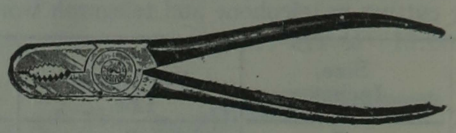

Fig. 379

IMPROVED

Forged from special crucible steel, oil tempered; polished jaws; gun barrel finish handles; heavy rivet at joint; milled teeth.

NO. 4

Length, Inches	5	6
Weight per Dozen, Lbs.	4	5½
Per Dozen	$4.10	4.70

GAS PLIERS

Fig. 380

DOUBLE JAWS

Forged from highest grade crucible steel, oil tempered; polished jaws; gun barrel finish handles; heavy rivet at joint; milled teeth.

NO. 14

Length, Inches	7	8	10
Weight per Dozen, Lbs.	7	9¾	15
Per Dozen	$5.40	5.85	7.15

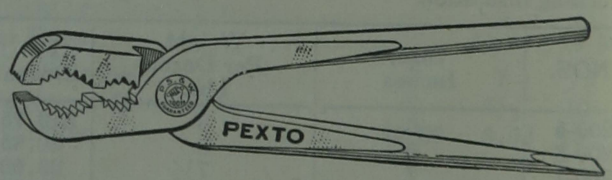

Fig. 381

Drop forged from crucible steel; oil tempered cutters; jaws polished nickel; heavy riveted; full finish.

These pliers supply a demand for general use; indispensable for plumbers, gas fitters and machinists.

NO. 13

Length, Inches	7	8	9	10
Weight per Dozen, Lbs.	4½	7½	10	11¼
Per Dozen	$4.10	4.70	5.25	6.10
Length, Inches	11	12	14	
Weight per Dozen, Lbs.	12½	16	21	
Per Dozen	$7.00	7.60	10.00	

All above, One-twelfth Dozen in a Carton
One-Half dozen Cartons in a Box

END CUTTING NIPPERS

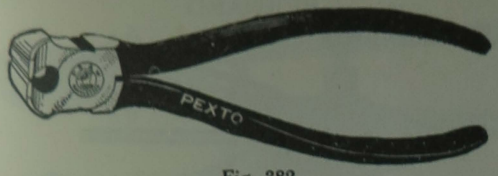

Fig. 382

LAP JOINT—MACHINISTS'

These nippers are forged from a high grade of crucible steel. Have polished head and gun barrel finish handles. Especially adapted for machinists' and general use.

NO. 72

Length, Inches	4	4½	5
Cutting Jaws, Width, Inch	¾	¾	15/16
Weight per Dozen, Lbs.	2½	2¾	3
Per Dozen	$6.75	7.50	8.25
Length, Inches	5½	6	8
Cutting Jaws, Width, Inches	1	1 1/16	1⅜
Weight per Dozen, Lbs.	3½	4	11
Per Dozen	$9.25	10.50	16.00

All above, One-twelfth Dozen in a Carton.
One Half-dozen Cartons in a Box.

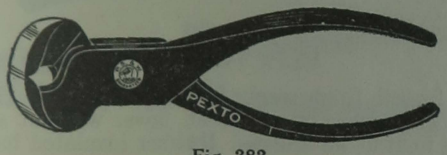

Fig. 383

Exceptionally strong. Used by electricians, mechanics, etc. Forged from high grade crucible steel; polished jaws; lap joint; gun barrel finish handles.

NO. 74

Length, Inches	5	6	7
Width Jaws, Inches	1	1¼	1½
Weight per Dozen, Lbs.	5	8	11
Per Dozen	$6.00	8.40	9.75

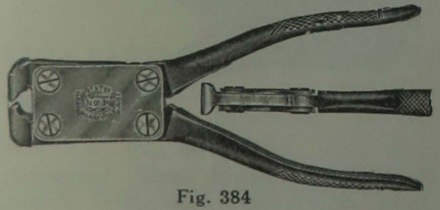

Fig. 384

COMPOUND

Forged from the best refined steel. Jaws are drop-forged, perfectly tempered; accurately designed. Mechanically perfect. Jaws for cutting music wire or other tempered fabric can also be furnished. Blued finish warranted.

NO. 3

Length, Inches	4½	5½	7½	9
Cuts Wire, Inch	1/16	3/32	5/32	3/16
Weight Dozen, Lbs.	4	6⅝	12⅞	22¼
Per Dozen	$24.50	26.25	31.45	38.20

All Above, One-twelth Dozen in a Carton
One Half-dozen Cartons in a Box

CUTTING NIPPERS

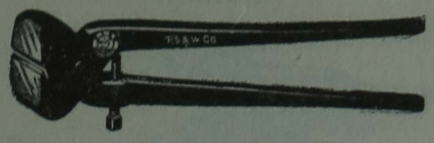

Fig. 385

High grade cast steel jaws; polished and tempered; blued finish; set screw between handles.

NOS.	5	4	3
Length, Inches	7	8	10
Jaws Open, Inches	1 1/16	1 1/16	1¼
Weight Each, Lbs.	¾	¾	1¼
Each	$1.00	1.40	1.50
NOS.	2	1	0
Length, Inches	11	12	14
Jaws Open, Inches	1⅜	1½	2
Weight Each, Lbs.	1¾	2¼	3½
Each	$1.85	1.95	3.25

Six in a Carton.

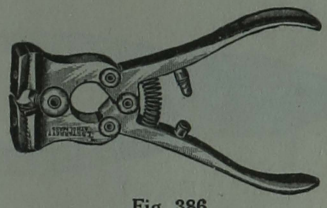

Fig. 386

WITH ADJUSTABLE JAWS

Head and handles drop-forged steel, finely finished. All parts case-hardened, except the jaws, which are properly tempered for their work. Jaws are detachable and can be ground and replaced. Type M will take music wire up to No. 25.

Type	Length, Inches	Description	Each
M	5½	For Music Wire	$3.50
C	5½	For Common Use	3.50
B	5½	For Bicycle Use	3.50
O	7	Either M. C. or B.	3.90

One in a Carton.

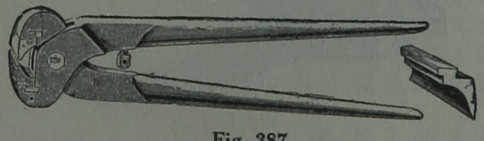

Fig. 387

CAREW PATENT—WITH REMOVABLE JAWS

Made of forged steel throughout. Jaws are made of best tool steel, carefully tempered; natural black finish.

Length, Inches	8	10	12	14
Weight Each, Lbs.	1½	2	3	4
Each	$2.60	2.85	3.30	4.00

EXTRA JAWS FOR ABOVE NIPPERS

	Per Pair
8-Inch	$0.75
10-Inch	.80
12-Inch	.85
14-Inch	.90

Packed Loose

PLIERS
BERNARD

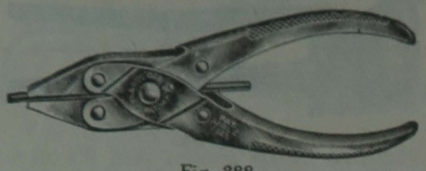

Fig. 388

FLAT NOSE

Jaws forged from tool steel, tempered; closed-in handles; steel rivets at joint; jaws parallel at all times; open throat allows a wire to pass entirely through; knurled grips; full nickel plated; face of jaws scored.

NO. 100

Length, Inches		4½	5	5½
Weight per Dozen, Lbs.		4	5⅛	6
Per Dozen		$6.00	7.00	8.00
Length, Inches	6	6½	7	8
Weight per Dozen	7⅛	7½	10½	14¼
Per Dozen	$9.00	10.00	12.00	15.00

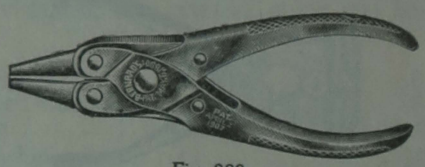

Fig. 389

ROUND NOSE

Made from crucible steel; parallel jaws; open throat; closed-in handles riveted to jaws. For gripping tubing and other articles that cannot be handled with flat nose pliers. Nickel finished.

NO. 101

Length, Inches		4½	5	5½
Weight per Dozen, Lbs.		4	5⅛	6
Per Dozen		$6.00	7.00	8.00
Length, Inches	6	6½	7	8
Weight per Dozen, Lbs.	7⅛	7½	10½	14¼
Per Dozen	$9.00	10.00	12.00	15.00

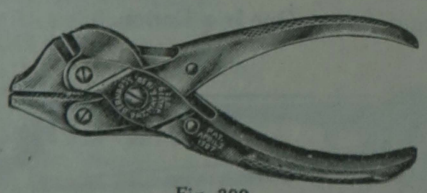

Fig. 390

CUTTING

Jaws forged from tool steel, tempered; closed-in handles; steel rivets at joint; jaws parallel at all times; open throat allows a wire to pass entirely through; side cutter allows cutting at angles and in spaces inaccessible to other pliers; knurled grips; full nickel plated; face of jaws scored.

NO. 102

Length, Inches		4½	5	5½
Weight per Dozen, Lbs.		4½	5½	6½
Per Dozen		$11.50	13.00	14.50
Length, Inches	6	6½	7	8
Weight per Dozen, Lbs.	8	8¼	11¼	14¾
Per Dozen	$16.00	17.50	20.00	25.00

All Above One-twelfth Dozen in a Carton
One-half Dozen Cartons in a Box

PLIERS
BERNARD

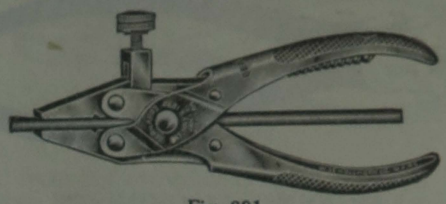

Fig. 391

VISE TYPE

Parallel jaws; handles stamped from heavy sheet steel; knurled grips; coil spring in handles; can be used as pliers, vise or clamp. Nickel finished. A non-friction spring automatically opens jaws unless closed by set screw.

NO. 113

Length, Inches	6½
Weight per Dozen, Lbs.	7¼
Per Dozen	$13.00

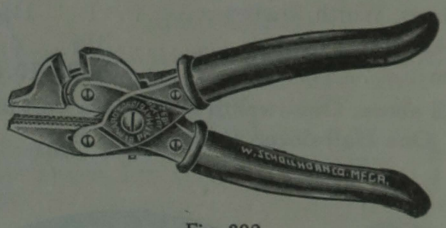

Fig. 392

ELECTRICIANS'

Jaws forged from steel, tempered; handles riveted to jaws; steel screws; open throat jaws; will cut soft wire up to ½ inch at all angles. Rubber insulated handles.

NO. 112

Length, Inches	8
Weight per Dozen, Lbs.	11
Per Dozen	$28.00

END CUTTING NIPPERS
BERNARD

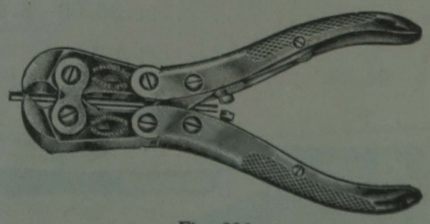

Fig. 393

Jaws forged from crucible steel, tempered; handles stamped from heavy sheet steel; steel screws; knurled grips; full nickel plated; open throat jaws; coil springs in handles. The compound system of leverage used makes this a very powerful tool.

NO. 125

Length, Inches		4	5
Capacity, Inch		1/16	3/32
Weight per Dozen, Lbs.		4½	6½
Per Dozen		$12.00	15.00
Length, Inches	6	7	8
Capacity, Inch	1/8	5/32	3/16
Weight per Dozen, Lbs.	9½	12¾	16¾
Per Dozen	$18.00	21.00	26.00

All Above One-twelfth Dozen in a Carton
One-half Dozen Cartons in a Box

BOLT CLIPPERS

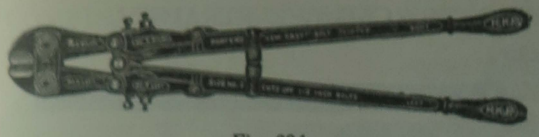

Fig. 394

NEW EASY

Jaws are forged from high grade tool steel, accurately tempered and ground; handles are japanned malleable iron; bumpers of high quality rubber; all parts are made to standard gauges and will always fit. Adjustment screw provides an ample readjustment of cutters. Special tempered jaws for cutting special material can also be furnished.

NOS.	Length, Inches	Cuts Bolts, Inch	Weight Each, Lbs.	Each
0	18	5/16	3	$3.75
1	24 1/2	3/8	5 3/4	5.00
2	30	1/2	9	7.00
3	36	5/8	13	9.00

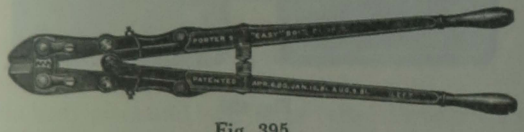

Fig. 395

EASY

Tempered oil finish; detachable cast steel cutting jaws; japanned cast iron compound lever handles with socket joints; rubber bumpers between handles.

NOS.	Length, Inches	Cuts, Bolts, Inch	Weight Each, Lbs.	Each
1	24	3/8	4 1/2	$5.00
2	30	1/2	7 4/5	7.00

EXTRA PARTS FOR BOLT CUTTERS

Parts	New Easy				Easy	
	No. 0 Each	No. 1 Each	No. 2 Each	No. 3 Each	No. 1 Each	No. 2 Each
Cutter Head	$2.10	$2.70	$3.70	$4.65	$2.85	$3.95
1 Pair Cutting Jaws	1.35	1.65	2.35	3.00	1.65	2.35
1 Cutting Jaw	.68	.83	1.18	1.50	.83	1.18
Bottom Strap and Bolts	.40	.50	.60	.70	.50	.60
Top Strap	.10	.20	.30	.40	.20	.30
1 Pair Lock Nuts	.10	.15	.20	.25	.15	.20
Lock Plate	.10	.15	.20	.25	.15	.20
Lock Plate Bolts	.05	.05	.05	.05	.10	.15
1 Pr. Handles Comp.	1.90	2.30	3.30	4.35	1.80	2.60
1 Handle Complete	.95	1.15	1.65	2.20	.90	1.30
Adjusting Section	.25	.30	.35	.40	.30	.35
1 Pr. Adj. Screws	.10	.12	.14	.16	.20	.25
1 Pr. Steel Jaw Bolts	.10	.12	.14	.16	.12	.14
1 Pair Eye Bolts	.20	.25	.30	.35		
Rubber Buffers	.20	.25	.30	.35	.06	.07
Pair Gears					.10	.15
Bolts for Gears					.10	.15

BOLT CLIPPERS

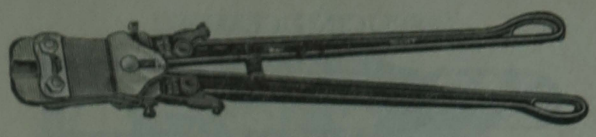

Fig. 396

STRAIGHT CUT

Will cut nuts, bolts or iron at almost any angle anywhere. Built for repair work on furnaces, stoves, wire fences, wagons, buggies, harness, autos, all kinds of machinery, etc. Especially needed in cement construction work and railroad repair shops.

NOS.	10A	14A	0A	1A	2A	3A
Size, Inch	3/16	1/4	1/4	3/8	1/2	5/8
Weight Each, Lbs.	2	3	4	6	11	17
Each	$2.75	3.00	3.75	5.00	7.00	9.00

Fig. 397

STRAIGHT AND END CUT

NOS.	10B	14B	0B
Size. Inch	3/16	1/4	5/16
Weight Each, Lbs.	2	3	4
Each	$3.75	4.00	4.75

NOS.	1B	2B	3B
Size, Inch	3/8	1/2	5/8
Weight Each, Lbs.	7	11	17
Each	$6.00	8.00	10.00

STRAIGHT END CUTTER WITH NUT SPLITTER

NOS.	0N	1N	2N
Size, Inch	5/16	3/8	1/2
Weight Each, Lbs.	4	7	11
Each	$5.75	7.00	9.00

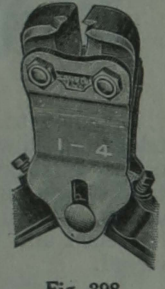

Fig. 398

EXTRA PARTS

Sizes, Inches	3/16	1/4	5/16	3/8	1/2	5/8
One Straight Cut Jaw	$0.40	.50	.68	.83	1.18	1.50
Pair Straight Cut Jaws	$0.75	1.00	1.35	1.65	2.35	3.00
One End Cut Jaw	$0.86	.91	1.01	1.16	1.68	2.08
Pair End Cut Jaws	$1.71	1.81	2.01	2.31	3.35	4.15
One End Cut Jaw with Nut Splitter			$1.34	1.65	2.26	
Pair Nut Splitters			$2.67	3.29	4.51	
One Handle	$0.30	.35	.40	.50	.90	1.35
Pair Handles, complete	$0.55	.65	.75	.95	1.25	1.65
Plates, each	$0.45	.55	.65	.75	.85	.95
One Adj. Section with One Rivet	$0.15	.20	.25	.30	.35	.40
Plate Bolts, Pair	$0.11	.15	.18	.24	.29	.35
Sliding Bolt	$0.06	.08	.10	.12	.15	.19
Set Screw, large	$0.08	.09	.10	.12	.13	.17
Set Screw, Small	$0.07	.08	.09	.10	.11	.12
Rubber Bumper and Rivet	$0.06	.08	.10	.12	.15	.30
Jaw and Handle Pin	$0.05	.06	.07	.08	.09	.10
Upper Strap	$0.05	.08	.10	.20	.30	40
Lower Strap	$0.13	.16	.18	.28	.38	.48

LINEMEN'S TOOLS

SPLICING CLAMPS

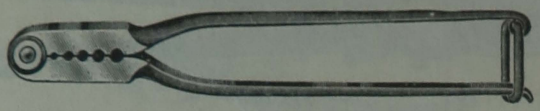

Fig. 399

Forged from highest grade of tool steel; oil tempered; heavy steel rivet; smooth jaws; polished head; black finish handles.

Each

NO. 102-3—Length, 10½ Inches; has Five Round Holes for Iron Wire, 6 to 14 B. W. G.; All Sizes Copper Wire from 4 to 12 B. & S. Gauge; Weight per Pair, 1¼ Lbs. $5.25

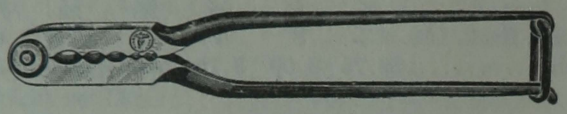

Fig. 400

Forged from highest grade of tool steel; oil tempered; heavy steel rivet; smooth jaws; polished head; black finish handles.

Each

NO. 102-5—Length, 10½ Inches; Three Oval Holes, Two Round Holes for Iron Wire, 4 to 14 B. W. G.; All Sizes Copper Wire from 2 to 12 B. & S. Gauge, Weight per Pair, 1¼ Lbs... $5.25

COMBINATION WIRE AND SLEEVE CLAMPS

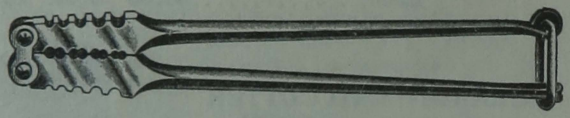

Fig. 401

Designed to meet requirements of general telephone, telegraph, railway and electric light work; they splice bare copper and iron wires, and can be used for twisting double tube sleeve joints by simply reversing the handles of the clamp. Forged from a select grade of tool steel, properly hardened and tempered. Handles will not buckle when closed.

Each

NO. 132-3—Length, 10¾ Inches; One Side Five Round Holes for Iron Wire, 6 to 14 B. W. G.; All Sizes Copper Wire from 14 to 12, B. & S. Gauge; Reverse Side has Four Sets of Chambers for Twisting Double Tube Copper Sleeve Joints Nos. 8 to 14 B. & S. Gauge; Iron 10 to 16 B. W. G.; Weight per Pair, 1¼ Lbs..... $6.04

One-half Dozen in a Box

CLIMBERS

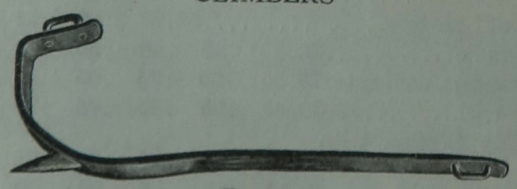

Fig. 402

EASTERN PATTERN

Forged from one piece spring steel; tempered spur welded and headed into bar; strap loops are riveted; oil finish; made in sizes 15 to 18 inches, from instep to end of the shank, ½-inch variations.

Per Pair

NO. 1900—Average Weight per Pair, 3⅝ Lbs..... $7.87

One Pair in a Carton

LINEMEN'S TOOLS

CLIMBER STRAPS

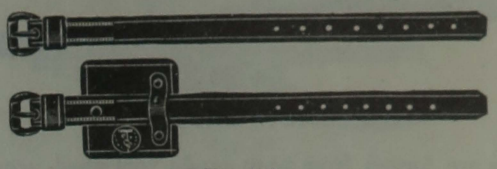

Fig. 403

Made of selected oak tanned harness leather; extra heavy roller buckles; set consists of two upper straps with 4x4 plain leather pads, and two lower straps.

Per Set

NO. 5301-1—Length of Straps Over All, 22 Inches; Width, 1¼ Inches; Weight per Set, 1¼ Lbs.. $8.75

Six Sets in a Package

CLIMBER PADS

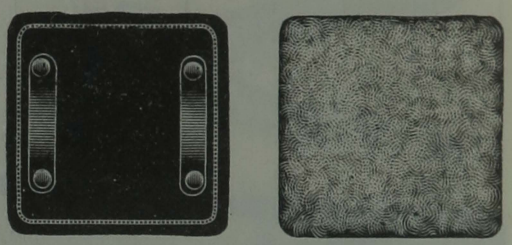

Fig. 404

Made of select plain leather and lined with sheepskin or felt arranged with loops through which to slip climber straps; Size 4x4 Inches; Weight per Pair, 1¼ Lbs.

Per Pair

NO. 8200—Sheep Lined $2.45
NO. 8201—Felt Lined $2.45
NO. 8202—Plain Leather $1.57

BELTS AND SAFETY STRAPS

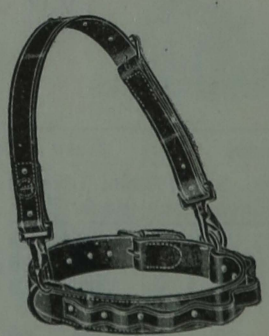

Fig. 405

Belt and strap made of select harness leather; the belt is provided with strong D rings securely sewed in and riveted to the main belt which passes through the D rings; the loop layer is 1⅛ inch wide, formed into six tool loops. The belt is 3½ inches wide; the strap is securely sewed, riveted and doubly reinforced. The snaps are of imperial type, japanned. Strap may be shortened or lengthened by adjustable buckle or it may be detached entirely from the belt.

Complete

NO. 5206-1A—Complete; Weight Each, 3½ Lbs..$19.95

TOOL BELTS ONLY

Each

NO. 5205—Width, 2¼ Inches; Weight Each, 2 Lbs. $4.87

SAFETY STRAPS ONLY

Each

NO. 5250—Width, 1¾ Inches; Length, 6 Feet; Weight Each, 2½ Lbs..... $9.45

LINEMEN'S TOOLS

COMBINATION LAG SCREW WRENCHES

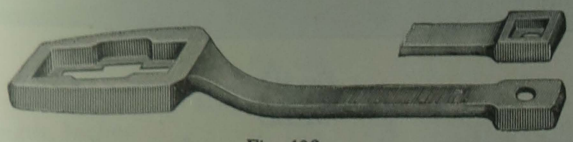

Fig. 406

Forged from bar steel; slot is cross-shaped, and will fit machine bolts, nuts or lag screws from $\frac{3}{8}$ inch to $\frac{5}{8}$ inch; small end of wrench is arranged for $\frac{5}{16}$ inch machine bolts or lag screws; round hole allows the end of a bolt to come through as the nut is run on. The jaw is wider at its upper portion, and when wrench is put on a nut or bolt, the tendency is to draw the bolt-head or nut into the wrench and prevent slipping off.

	Each
NO. 3109-20—Length, 13½ Inches; Weight Each, 1⅔ Lbs.	$5.25

CHICAGO GRIPS FOR BARE WIRE

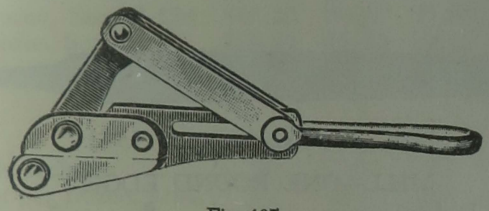

Fig. 407

Main body piece and lever forged steel; draw parts are of wrought steel; gripping jaws are machined smooth; rivets are machine turned. It is handy to put on and holds itself in place by means of a spring acting on the compressing lever.

	Each
NO. 1613-20—For No. 10 Wire and Smaller; Weight Each, 1 Lb.	$6.30
NO. 1613-30—For No. 6 Wire and Smaller; Weight Each, 1½ Lbs.	7.00
NO. 1613-40—For No. 0 Wire and Smaller; Weight Each, 2⅝ Lbs.	11.24
NO. 1613-50—For No. 0000 Wire and Smaller; Weight Each, 7½ Lbs.	21.00

One-half Dozen in a Box

IMPROVED HAVENS GRIPS

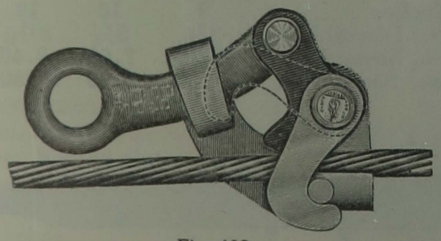

Fig. 408

Forged from crucible tool steel; adapted for handling plain or stranded wire from No. 6 to ¾ inch in diameter. The particular feature of construction is the addition of a swing latch which engages with stud on the lower jaw, thus centralizing the pressure on the cross bolt, which is strongly made of turned machined steel. Lever, gun metal finish; frame, galvanized finish.

	Each
NO. 1625-20—Weight Each, 5¾ Lbs.	$13.12

One-half Dozen in a Box

LINEMEN'S TOOLS

HAVENS STEEL GRIPS

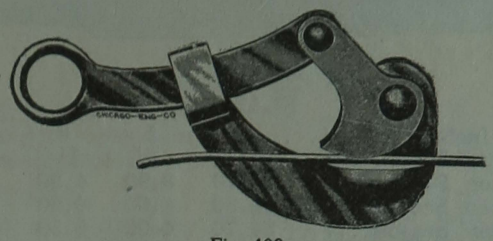

Fig. 409

Forged from crucible tool steel. Eccentric or dog is hand cut, hardened and tempered; all rivets are steel and machine turned; almost automatic in action; the handle and eccentric allows instantaneous hold; a shake of the rope on tackle disengages or releases the grip; it will not slip, heavy strain only making it grip the tighter.

	Each
NO. 1604-10—No 8 Wire and Finer, Weight Each, 1 Lb.	$4.37
NO. 1604-20—½-Inch Wire and Finer, Weight Each, 2½ Lbs.	6.12

One-half Dozen in a Box

COME ALONGS

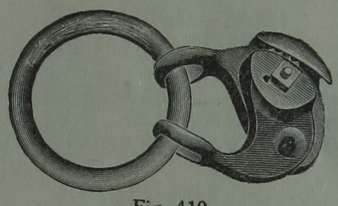

Fig. 410

Body of the grip is cast from refined malleable iron; eccentric is forged from high-grade tool steel, hardened and tempered; ring is hand forged and welded through the eyes of the clamp. This style grip is frequently used for fence work.

	Each
NO. 1609-20—For No. 8 Wire and Smaller; Weight Each, 1 Lb.	$1.67
NO. 1609-30—For No. 6 Wire and Smaller; Weight Each, 2 Lbs.	2.19
NO. 1609-40—For No. 0 Wire and Smaller; Weight Each, 2¼ Lbs.	2.80

HOWES' WIRE TOOLS

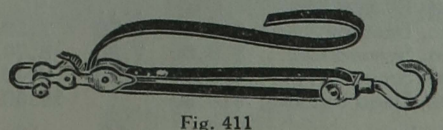

Fig. 411

Swivel hook is steel with an opening large enough to go over an insulator pin or other convenient object to anchor to; the forward end has a locking device to hold the load at any distance. It is arranged so that either a vise or grip can be attached.

	Each
NO. 1702-20—Single Purchase; Strap 1¼ Inch Wide, 9 Feet Long; Weight per Set, 2 Lbs.	$7.70
NO. 1702-30—Double Purchase; Strap 1⅛ Inch Wide, 10 Feet Long; Weight per Set, 2½ Lbs.	10.85

FAIRBANKS BRAND FILES

Fig. 412

FLAT

Length, Inches	4	5	6	7
Weight per Dozen, Lbs.	9/16	7/8	1 1/2	2 1/8
Per Dozen, Bastard	$3.70	3.90	4.30	4.80
Per Dozen, Second Cut	$4.30	4.60	4.80	5.50
Per Dozen, Smooth	$4.70	4.90	5.30	6.10

Length, Inches	8	9	10	11	12
Weight per Doz., Lbs.	3 7/16	4 3/4	6 7/8	9 3/4	11 3/4
Per Dozen, Bastard	$ 5.30	6.30	7.00	8.60	9.70
Per Dozen, Second Cut.	$ 6.10	7.20	8.10	....	11.00
Per Dozen, Smooth	$ 6.60	7.90	8.70	....	12.10
Per Dozen, Dead Smooth	$10.60	....	14.00	....	19.40

Length, Inches	13	14	16	18	20
Weight per Doz., Lbs.	.....	18 9/16	27	38 1/2	52
Per Dozen, Bastard	$11.80	13.30	17.80	23.90	31.50
Per Dozen, Second Cut	.....	$15.30	20.10	26.80	35.30
Per Dozen, Smooth	.....	$16.70	22.30	29.20	38.30
Per Dozen, Dead Smooth	....	$26.60	.....	.....	.....

Fig. 413

FLAT—OPEN CUT

Length, Inches	8	10	12	14
Weight per Dozen, Lbs.	3 7/16	6 7/8	11 3/4	18 7/16
Per Dozen, Bastard	$6.30	8.60	11.80	16.00
Per Dozen, Second Cut	$7.20	9.80	13.60	18.30
Per Dozen, Smooth	$7.90	10.70	14.70	20.00

FLAT—SINGLE CUT

Coarse and Bastard

Length, Inches	8	10	12	14
Weight per Dozen, Lbs.	3 7/16	6 7/8	11 3/4	18 7/16
Per Dozen	$6.30	8.60	11.80	16.00

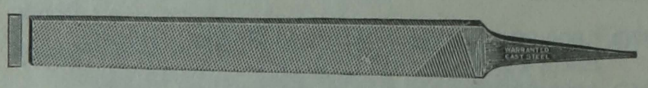

Fig. 414

HAND

Length, Inches	4	5	6	7
Weight per Dozen, Lbs.	1 3/16	1 7/16	2 5/16	.....
Per Dozen, Bastard	$3.70	3.90	4.30	4.90
Per Dozen Second Cut	$4.30	4.70	5.10	5.80
Per Dozen, Smooth	$4.80	5.30	5.60	6.30

Length, Inches	8	9	10	12
Weight per Dozen, Lbs.	4 13/16	....	9 1/8	14 1/4
Per Dozen, Bastard	$ 5.40	6.70	7.50	10.70
Per Dozen, Second Cut	$ 6.30	7.80	8.70	12.30
Per Dozen, Smooth	$ 6.70	8.80	9.40	13.50
Per Dozen, Dead Smooth	$10.80	....	15.00	21.40

Length, Inches	14	16	18	20
Weight per Dozen, Lbs.	21 13/16	31 5/16	43 5/8	58
Per Dozen, Bastard	$15.00	20.10	26.80	35.10
Per Dozen, Second Cut	$17.00	22.80	29.90	39.20
Per Dozen, Smooth	$18.20	24.20	31.50	41.60
Per Dozen, Dead Smooth	$30.00	.....	.....	.....

HAND FINISHING

Length, Inches	8	10	12	14
Weight per Dozen, Lbs.	4 13/16	9 1/8	14 1/4	21 13/16
Per Dozen, Second Cut	$7.80	10.90	15.20	20.60
Per Dozen, Smooth	$8.30	11.80	16.20	21.70

Fig. 415

MILL

Length, Inches	4	5	6
Weight per Dozen, Lbs.	7/16	3/4	1 5/16
Per Dozen, Bastard	$3.00	3.20	3.50
Per Dozen, Second Cut	....	....	$4.00
Per Dozen, Smooth	....	....	$4.50

Length, Inches	7	8	9	10
Weight per Dozen, Lbs.	....	3	4 1/4	5 5/8
Per Dozen, Bastard	$3.90	4.30	4.90	5.60
Per Dozen, Second Cut	$4.60	4.90	5.80	6.40
Per Dozen, Smooth	$4.90	5.40	6.30	7.00

Length, Inches	12	14	16	18
Weight per Dozen, Lbs.	9 3/16	14	20 1/8	.....
Per Dozen, Bastard	$7.50	10.70	14.70	20.20
Per Dozen, Second Cut	$8.60	12.20	16.80	.....
Per Dozen, Smooth	$9.40	13.10	17.90	.....

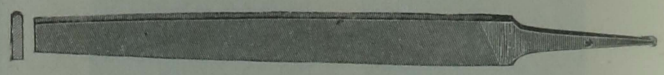

Fig. 416

MILL—ONE ROUND EDGE

Length, Inches	6	7	8
Weight per Dozen, Lbs.	1 1/4	....	2 7/8
Per Dozen Bastard	$3.90	4.40	4.80
Per Dozen, Second Cut	$4.50	5.20	5.50

Length, Inches	9	10	12	14
Weight per Dozen, Lbs.	4 1/16	5 7/16	8 15/16	13 5/8
Per Dozen, Bastard	$5.50	6.30	8.40	12.00
Per Dozen, Second Cut	$6.50	7.20	9.70	13.70

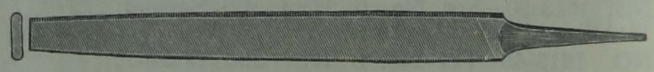

Fig. 417

MILL—TWO ROUND EDGES

Length, Inches	6	7	8
Weight per Dozen, Lbs.	1 3/16	....	2 3/4
Per Dozen, Bastard	$4.40	4.90	5.40
Per Dozen, Second Cut	$5.00	5.80	6.10

Length, Inches	9	10	12	14
Weight per Dozen, Lbs.	3 7/8	5 1/4	8 11/16	13 1/4
Per Dozen, Bastard	$6.10	7.00	9.40	13.40
Per Dozen, Second Cut	$7.30	8.00	10.80	15.30

Fig. 418

MILL BLUNT

Length, Inches	6	7	8
Weight per Dozen, Lbs.	1 5/16	....	3 1/8
Per Dozen, Bastard	$3.90	4.30	4.90
Per Dozen, Second Cut	$4.60	4.90	5.80

Length, Inches	9	10	12
Weight per Dozen, Lbs.	4 9/16	5 3/4	10 1/8
Per Dozen, Bastard	$5.60	6.70	9.40
Per Dozen, Second Cut	$6.40	7.80	10.70

FAIRBANKS V BRAND FILES

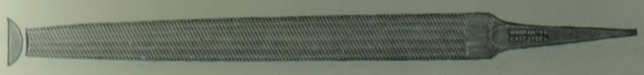

Fig. 419

HALF ROUND

Length, Inches	4	5	6
Weight per Dozen, Lbs.	1/2	7/8	1 1/2
Per Dozen, Bastard	$4.80	5.40	6.10
Per Dozen, Second Cut	$5.60	6.10	6.70
Per Dozen, Smooth	$6.10	6.40	7.10

Length, Inches	7	8	10	12
Weight per Dozen, Lbs.	.....	3 1/4	6 5/16	10 9/16
Per Dozen, Bastard	$7.00	7.50	9.10	11.80
Per Dozen, Second Cut	$7.70	8.30	10.10	13.00
Per Dozen, Smooth	$8.20	8.90	10.70	13.90
Per Dozen, Dead Smooth	.....	$15.00	18.20	23.60

Length, Inches	14	16	18	20
Weight per Dozen, Lbs.	16 5/8	23 5/16	34	46
Per Dozen, Bastard	$15.50	20.60	27.50	36.20
Per Dozen, Second Cut	$17.00	22.50	29.90	39.40
Per Dozen, Smooth	$18.30	24.20	32.00	42.30
Per Dozen, Dead Smooth	$31.00	.....	.....	.....

HALF ROUND—OPEN CUT

Length, Inches	8	10	12	14
Weight per Dozen, Lbs.	3 1/4	6 5/16	10 9/16	16 5/8
Per Dozen, Bastard	$8.50	10.70	14.10	18.50
Per Dozen, Second Cut	$9.40	11.80	15.40	20.40
Per Dozen, Smooth	$9.90	12.70	16.60	21.70

Fig. 420

CROSSING—BASTARD

Length, Inches	12	14	16
Weight per Dozen, Lbs.	13 1/4	20 5/8	30 5/8
Per Dozen	$15.50	20.60	27.50

Fig. 421

SQUARE

Length, Inches	4	5	6
Weight per Dozen, Lb.	1/4	1/2	13/16
Per Dozen, Bastard	$3.80	4.10	4.60
Per Dozen, Second Cut	$4.60	4.80	5.10
Per Dozen, Smooth	$4.90	5.30	5.50

Length, Inches	7	8	10	12
Weight per Dozen, Lbs.	1 1/4	1 15/16	3 15/16	8 3/8
Per Dozen, Bastard	$5.10	5.50	7.40	10.20
Per Dozen, Second Cut	$5.80	6.30	8.50	11.50
Per Dozen, Smooth	$6.30	7.00	9.10	12.80

Length, Inches	14	16	18	20
Weight per Dozen, Lbs.	15 1/4	25 1/4	39 3/16	57
Per Dozen, Bastard	$13.90	18.70	25.10	32.80
Per Dozen, Second Cut	$16.10	21.20	28.20	36.70
Per Dozen, Smooth	$17.50	23.30	30.40	39.30

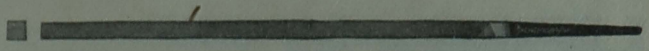

Fig. 422

SQUARE—BLUNT

Length, Inches	6	8	10
Weight per Dozen, Lbs.	1 1/4	2 5/16	4 7/16
Per Dozen, Bastard	$5.50	7.40	10.20

Length, Inches	12	14	16	18
Weight per Dozen, Lbs.	9 13/16	18 1/8	29 3/16	..
Per Dozen, Bastard	$13.90	18.70	25.10	32.80

Fig. 423

WARDING

Length, Inches	4	5	6	8	10
Weight per Dozen, Lbs.	5/16	1/2	3/4	1 11/16	3 3/16
Per Dozen, Bastard	$4.00	4.50	4.90	6.40	8.70
Per Dozen, Second Cut	$4.80	5.30	5.90	7.50	10.10
Per Dozen, Smooth	$5.40	5.80	6.40	8.20	11.00

Fig. 424

ROUND

Length, Inches	4	5	6	7
Weight per Dozen, Lbs.	1/4	7/16	3/4	1 1/8
Per Dozen, Bastard	$3.00	3.20	3.50	3.90
Per Dozen, Second Cut	$3.50	3.80	4.00	4.60
Per Dozen, Smooth	$3.90	4.10	4.50	4.90

Length, Inches	8	9	10	12
Weight per Dozen, Lbs.	1 9/16	2 1/4	3	6 13/16
Per Dozen, Bastard	$4.30	4.90	5.60	7.50
Per Dozen, Second Cut	$4.90	5.80	6.40	8.60
Per Dozen, Smooth	$5.40	6.30	7.00	9.40

Length, Inches	14	16	18	20
Weight per Dozen, Lbs.	12 1/8	20 3/16	32 5/8	49
Per Dozen, Bastard	$10.70	14.70	20.20	27.40
Per Dozen, Second Cut	$12.20	16.80	22.70	30.70
Per Dozen, Smooth	$13.10	17.90	24.30	32.90

ROUND—BLUNT—BASTARD

Length, Inches	8	10	12	14
Weight per Dozen, Lbs.	2 1/8	3 15/16	8 3/8	14 3/4
Per Dozen	$5.60	7.50	10.70	14.70

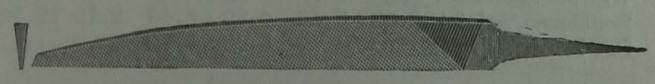

Fig. 425

KNIFE—BASTARD

Length, Inches	4	5	6
Weight per Dozen, Lb.	3/8	5/8	15/16
Per Dozen, Bastard	$5.40	6.10	6.90
Per Dozen, Second Cut	$6.10	6.70	7.50
Per Dozen, Smooth	$6.40	7.10	7.90

Length, Inches	8	10	12
Weight per Dozen, Lbs.	2 3/8	4 3/8	7 3/8
Per Dozen, Bastard	$8.50	10.10	13.70
Per Dozen, Second Cut	$9.10	11.50	15.20
Per Dozen, Smooth	$9.50	12.30	16.10

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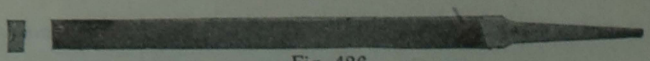


Fig. 426

PILLAR

Length, Inches	6	8	10
Weight per Dozen, Lbs.	1 9/16	3 5/8	6 5/8
Per Dozen, Bastard	$4.30	5.40	7.50
Per Dozen, Second Cut	$5.10	6.30	8.70
Per Dozen, Smooth	$5.60	6.70	9.40

Length, Inches	12	14	16
Weight per Dozen, Lbs.	10 15/16	18 1/8	25 1/2
Per Dozen, Bastard	$10.70	15.00	20.10
Per Dozen, Second Cut	$12.30	17.00	22.80
Per Dozen, Smooth	$13.50	18.20	24.20

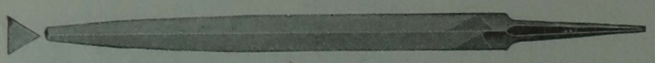


Fig. 427

THREE SQUARE

Length, Inches	4	5	6
Weight per Dozen, Lbs.	3/4	1 1/4	2 1/8
Per Dozen, Bastard	$4.80	5.40	6.10
Per Dozen, Second Cut	$5.60	6.10	6.70
Per Dozen, Smooth	$6.10	6.40	7.10

Length, Inches	7	8	10	12
Weight per Dozen, Lbs.	3 1/4	4 5/16	7 5/8	13
Per Dozen, Bastard	$7.00	7.50	9.10	11.80
Per Dozen, Second Cut	$7.70	8.30	10.10	13.00
Per Dozen, Smooth	$8.20	8.90	10.70	13.90

Length, Inches	14	16	18	20
Weight per Dozen, Lbs.	20	27 3/16	38 5/8	51
Per Dozen, Bastard	$15.50	20.60	27.50	36.20
Per Dozen, Second Cut	$17.00	22.50	29.90	39.40
Per Dozen, Smooth	$18.30	24.20	32.00	42.30

Fig. 428

TAPER

Length, Inches	3	3 1/2	4	4 1/2	5
Weight per Dozen, Lbs.	1/4	7/16	3/4	15/16	1 3/16
Per Dozen, Single Cut	$2.10	2.10	2.20	2.40	2.60
Per Dozen, Double Cut	$2.50	2.50	2.90	3.10	3.50

Length, Inches	5 1/2	6	7	8	10	12
Wgt. per Doz. Lbs.	1 9/16	2	2 15/16	4 3/16	7 7/16	12 11/16
Per Dozen, Single Cut	$3.00	3.40	4.30	5.40	8.10	12.50
Per Dozen, Double Cut		$4.70	5.60	6.70	....	.....

Fig. 429

HEAVY TAPER

Length, Inches	3	3 1/2	4	4 1/2	5
Weight per Dozen, Lbs.	3/8	11/16	13/16	15/16	1 5/8
Per Dozen	$2.10	2.10	2.20	2.40	2.60

Length, Inches	5 1/2	6	7	8	10
Weight per Dozen, Lbs.	2 5/16	2 1/2	3 7/8	4 7/8	9 1/16
Per Dozen	$3.00	3.40	4.30	5.40	8.10

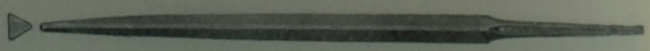


Fig. 430

SLIM TAPER

Length, Inches	3	3 1/2	4
Weight per Dozen, Lb.	1/8	3/16	5/16
Per Dozen	$2.10	2.10	2.20

Length, Inches	4 1/2	5	5 1/2	6
Weight per Dozen, Lbs.	7/16	5/8	3/4	1 1/8
Per Dozen	$2.30	2.50	2.90	3.10

Length, Inches	7	8	10	12
Weight per Dozen, Lbs.	1 3/4	2 5/8	5 5/16	9
Per Dozen	$3.80	4.50	6.40	9.50

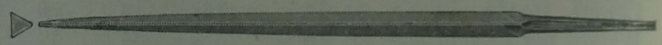


Fig. 431

EXTRA SLIM TAPER

Length, Inches	4	4 1/2	5
Per Dozen	$2.20	2.30	2.50
Length, Inches	5 1/2	6	7	8
Per Dozen	$2.90	3.10	3.80	4.50

Fig. 432

DOUBLE ENDED TAPER

Length, Inches	7	8	9	10
Weight per Dozen, Lbs.	7/16	13/16	1 7/16	1 11/16
Per Dozen	$3.50	3.90	4.40	4.90

HAND SAW—BLUNT

Length, Inches	4	4 1/2	5
Weight per Dozen, Lbs.	7/8	1 1/4	2
Per Dozen	$2.60	3.00	3.40

Length, Inches	6	7	8
Weight per Dozen, Lbs.	2 7/8	4 9/16	5 1/2
Per Dozen	$4.30	5.40	6.60

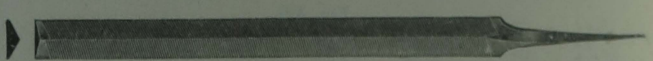


Fig. 433

CANT SAW

Length, Inches	6	8	10
Weight per Dozen, Lbs.	1 1/8	2 7/16	4 7/8
Per Dozen	$5.40	6.40	8.70

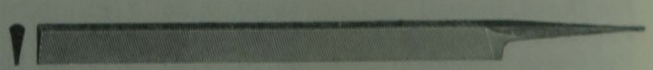


Fig. 434

CROSS CUT SAW

Length Inches	8	10
Weight per Dozen, Lbs.	3 7/16	6 7/8
Per Dozen	$7.50	9.10

FAIRBANKS BRAND ▽F FILES AND RASPS

Fig. 435

PIT SAW

Length, Inches	4	4½	5
Weight per Dozen, Lbs.	9/16	3/4	15/16
Per Dozen	$4.80	5.40	5.40

Length, Inches	5½	6	8
Weight per Dozen, Lbs.	1 5/16	1 5/8	3½
Per Dozen	$6.10	6.10	7.50

Fig. 436

PLANER KNIFE

Length, Inches	8	10
Weight per Dozen, Lbs.	3½	7
Per Dozen	$6.40	8.60

Fig. 437

LEAD FLOATS AND WOOD FILES—FLAT

Length, Inches	6	8	10	12	14	16
Wgt. per Doz., Lbs.	1½	3 3/16	6 7/8	11¾	18 7/16	27
Per Dozen	$4.80	6.30	8.60	11.80	16.00	21.50

LEAD FLOATS AND WOOD FILES—HALF ROUND

Length, Inches	6	8	10	12	14	16
Wgt. per Doz., Lbs.	1 1/8	3¼	6 5/16	10 9/16	16 5/8	23 5/16
Per Dozen	$7.00	8.50	10.70	14.10	18.50	24.70

Fig 438

CABINET FILES

Length, Inches	6	8	10	12	14
Weight per Dozen, Lbs.	1 5/16	3	5 5/8	9 7/16	13 11/16
Per Dozen	$8.10	10.10	13.70	18.70	24.80

Fig. 439

HALF ROUND WOOD RASPS

Length, Inches	6	8	10
Weight per Dozen, Lbs.	1½	3¼	6 3/16
Per Dozen, Bastard	$ 8.10	10.10	13.70
Per Dozen, Second Cut	$ 9.30	12.20	16.80
Per Dozen, Smooth	$10.10	13.70	18.70

Length, Inches	12	14	16
Weight per Dozen, Lbs.	10 9/16	16 3/8	23
Per Dozen, Bastard	$18.70	24.80	32.90
Per Dozen, Second Cut	$22.40	29.70	38.90
Per Dozen, Smooth	$24.80	32.90	43.60

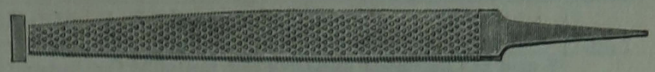


Fig. 440

FLAT WOOD RASPS

Length, Inches	8	10	12	14	16
Weight per Dozen, Lbs.	3 7/16	6 7/8	11¾	18 7/16	27
Per Dozen, Bastard	$ 9.40	12.80	17.50	23.20	30.80
Per Dozen, Second Cut	$11.40	15.50	20.90	27.80	36.20

Fig. 441

CABINET RASPS

Length, Inches	6	8	10	12	14
Weight per Dozen. Lbs.	1 5/16	3	5 5/8	9 7/16	13 11/16
Per Dozen, Second Cut	$10.10	12.80	17.50	22.80	29.60
Per Dozen, Smooth	$11.70	15.50	20.70	26.80	33.90

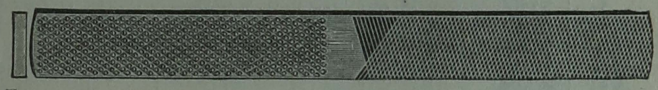


Fig. 442

SHOE RASPS

Length, Inches	8	9	10
Weight per Dozen, Lbs.	3 13/16	5 5/16	7 9/16
Per Dozen, Flat	$10.10	12.20	13.70
Per Dozen, Half Round	$10.10	12.20	13.70

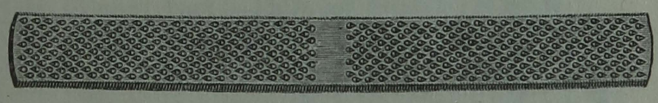


Fig. 443

HORSE RASPS—PLAIN

Length, Inches	12	14	15	16	18
Weight per Dozen, Lbs.	15¼	19 15/16	23 7/8	28 13/16	38 1/8
Per Dozen, ½ File	$12.80	17.80	20.90	24.40	32.90
Per Dozen, ¼ File	$14.40	20.10	23.60	27.50	36.20

HORSE RASPS—PLAIN—REVERSE

Length, Inches	14	15	16
Weight per Dozen, Lbs.	19 15/16	23 7/8	28 13/16
Per Dozen	$17.80	20.90	24.40

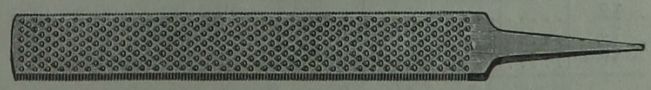


Fig. 444

HORSE RASPS—TANGED

Length, Inches	12	13	14	16
Weight per Dozen, Lbs.	20½	24¼	30 1/8	39¾
Per Dozen	$16.80	19.60	23.10	32.20

HORSE RASPS—TANGED—SLIM

Length, Inches	14	16
From Stock, Inches	12	14
Weight per Dozen, Lbs.	24	33
Per Dozen	$21.90	29.70

FAIRBANKS BRAND ⓕ FILES AND RASPS

List Adopted November, 1889. PRICE PER DOZEN Revised January 1, 1919.

Inch	Mill			Mill 1 R. E.		Mill 2 R. E.		Mill Blunt		Tapers		Hand-saw Blunt	Slim Taper	Extra Slim Taper	Heavy Taper	Bandsaw Blunt and Taper		Pitsaw
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Bastard	2d Cut	Bastard	2d Cut	Sgl. Cut	Dbl. Cut					Regular	Slim	
3	.....	.....	.....	.....	.....	.....	.....	.....	.....	$2.10	$2.50	.....	$2.10	.....	$2.10	.....	.....	.....
3½	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.10	2.50	.....	2.10	.....	2.10	.....	.....	.....
4	$3.00	.....	.....	.....	.....	.....	.....	.....	.....	2.20	2.90	$2.60	2.20	$2.20	2.20	$2.90	.....	$4.80
4½	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.40	3.10	3.00	2.30	2.30	2.40	3.10	.....	5.40
5	3.20	.....	.....	.....	.....	.....	.....	.....	.....	2.60	3.50	3.40	2.50	2.50	2.60	3.50	.....	5.40
5½	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.00	.....	.....	2.90	2.90	3.00	.....	.....	6.10
6	3.50	$4.00	$4.50	$3.90	$4.50	$4.40	$5.00	$3.90	$4.60	3.40	4.70	4.30	3.10	3.10	3.40	4.70	$3.90	6.10
7	3.90	4.60	4.90	4.40	5.20	4.90	5.80	4.30	4.90	4.30	5.60	5.40	3.80	3.80	4.30	5.60	.....	.....
8	4.30	4.90	5.40	4.80	5.50	5.40	6.10	4.90	5.80	5.40	6 70	6.60	4.50	4.50	5.40	6.70	5.30	7.50
9	4.90	5.80	6.30	5.50	6.50	6.10	7.30	5.60	6.40	.....	.....	.....	.....	.....	.....	Crossing Bastard		.....
10	5.60	6.40	7.00	6.30	7.20	7.00	8.00	6.70	7.80	8.10	.....	.....	6.40	.....	8.10	15.50		.....
12	7.50	8.60	9.40	8.40	9.70	9.40	10.80	9.40	10.70	12.50	.....	.....	9.50	.....	.....	20.60		.....
14	10.70	12.20	13.10	12.00	13.70	13.40	15.30	.....	.....	.....	.....	.....	.....	.....	.....	27.50		.....
16	14.70	16.80	17.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....
18	20.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....

Inch	Flat			Hand			Square			Three Square			Half Round			Round		
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth
4	3.70	4.30	4.70	3.70	4.30	4.80	3.80	4.60	4.90	4.80	5.60	6.10	4.80	5.60	6.10	3.00	3.50	3.90
5	3.90	4.60	4.90	3.90	4.70	5.30	4.10	4.80	5.30	5.40	6.10	6.40	5.40	6.10	6.40	3.20	3.80	4.10
6	4.30	4.80	5.30	4.30	5.10	5.60	4.60	5.10	5.50	6.10	6.70	7.10	6.10	6.70	7.10	3.50	4.00	4.50
7	4.80	5.50	6.10	4.90	5.80	6.30	5.10	5.80	6.30	7.00	7.70	8.20	7.00	7.70	8.20	3.90	4.60	4.90
8	5.30	6.10	6.60	5.40	6.30	6.70	5.50	6.30	7.00	7.50	8.30	8.90	7.50	8.30	8.90	4.30	4.90	5.40
9	6.30	7.20	7.90	6.70	7.80	8.30	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.90	5.80	6.30
10	7.00	8.10	8.70	7.50	8.70	9.40	7.40	8.50	9.10	9.10	10.10	10.70	9.10	10.10	10.70	5.60	6.40	7.00
11	8.60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
12	9.70	11.00	12.10	10.70	12.30	13.50	10.20	11.50	12.80	11.80	13.00	13.90	11.80	13.00	13.90	7.50	8.60	9.40
13	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
14	13.30	15.30	16.70	15.00	17.00	18.20	13.90	16.10	17.50	15.50	17.00	18.30	15.50	17.00	18.30	10.70	12.20	13.10
16	17.80	20.10	22.30	20.10	22.80	24.20	18.70	21.20	23.30	20.60	22.50	24.20	20.60	22.50	24.20	14.70	16.80	17.90
18	23.90	26.80	29.20	26.80	29.90	31.50	25.10	28.20	30.40	27.50	29.90	32.00	27.50	29.90	32.00	20.20	22.70	24.30
20	31.50	35.30	38.30	35.10	39.20	41.60	32.80	36.70	39.30	36.20	39.40	42.30	36.20	39.40	42.30	27.40	30.70	32.90

Inch	Pillar			Warding			Knife			Square Blunt	Round Blunt	Hand Finishing		Flat Dead	Hand Dead	Hf. Rd. Dead	Lead Float and Wood Files	
	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	Bastard	2d Cut	Smooth	Smooth	Smooth	Smooth	Flat	Hf. Rd.
4	.....	.....	.....	4.00	4.80	5.40	5.40	6.10	6.40	.....	.....	.....	.....	.....	.....	.....	.....	.....
5	.....	.....	.....	4.50	5.30	5.80	6.10	6.70	7.10	.....	.....	.....	.....	.....	.....	.....	.....	.....
6	4.30	5.10	5.60	4.90	5.90	6.40	6.90	7.50	7.90	5.50	.....	.....	.....	.....	.....	.....	4.80	7.00
8	5.40	6.30	6.70	6.40	7.50	8.20	8.50	9.10	9.50	7.40	5.60	7.80	8.30	10.60	10.80	15.00	6.30	8.50
10	7.50	8.70	9.40	8.70	10.10	11.00	10.10	11.50	12.30	10.20	7.50	10.90	11.80	14.00	15.00	18.20	8.60	10.70
12	10.70	12.30	13.50	.....	.....	.....	13.70	15.20	16.10	13.90	10.70	15.20	16.20	19.40	21.40	23.60	11.80	14.10
14	15.00	17.00	18.20	.....	.....	.....	.....	.....	.....	18.70	14.70	20.60	21.70	26.60	30.00	31.00	16.00	18.50
16	20.10	22.80	24.20	.....	.....	.....	.....	.....	.....	25.10	.....	.....	.....	.....	.....	.....	21.50	24.70
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	32.80	.....	.....	.....	.....	.....	.....	.....	.....

Inch	Double Ended Taper	Cant Saw	Cross Cut	Hook Tooth	Planer Knife	Cabinet Files	Cabinet Rasps		Flat Sgl. Cut Coarse & Bast.	Flat Open Cut			Half Round Open Cut			Half Round Wood Rasps		
							2d Cut	Smooth		Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth	Bastard	2d Cut	Smooth
6	.....	5.40	.....	.....	.....	8.10	10.10	11.70	.....	.....	.....	.....	.....	.....	.....	8.10	9.30	10.10
7	3.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	3.90	6.40	7.50	8.30	6.40	10.10	12.80	15.50	6.30	6.30	7.20	7.90	8.50	9.40	9.90	10.10	12.20	13.70
9	4.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	4.90	8.70	9.10	10.10	8.60	13.70	17.50	20.70	8.60	8.60	9.80	10.70	10.70	11.80	12.70	13.70	16.80	18.70
12	.....	.....	.....	.....	.....	18.70	22.80	26.80	11.80	11.80	13.60	14.70	14.10	15.40	16.60	18.70	22.40	24.80
14	.....	.....	.....	.....	.....	24.80	29.60	33.90	16.00	16.00	18.30	20.00	18.50	20.40	21.70	24.80	29.70	32.90
16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	32.90	38.90	43.60

Inch	Flat Wood Rasps		Horse Rasps, Plain			Horse Rasps, Plain Slim				Horse Rasps					Shoe Rasps	
	Bastard	2d Cut	½ File	¼ File	Reverse			½ File	¼ File	Tanged	Tanged Slim		Tanged Thin		Flat	Hf. Rd.
8	9.40	11.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10.10	10.10
9	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12.20	12.20
10	12.80	15.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13.70	13.70
12	17.50	20.90	12.80	14.40	.....	.....	.....	.....	.....	16.80	.....	.....	1.531″ x.270″	16.00	.....	.....
13	.....	.....	.....	.....	.....	.....	.....	.....	.....	19.60	.....	.....	1.594″ x.275″	18.20	.....	.....
14	23.20	27.80	17.80	20.10	17.80	.....	.....	.....	.....	23.10	14″ from 12″ stk.	21.90	1.750″ x.280″	21.90	.....	.....
15	.....	.....	20.90	23.60	20.90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
16	30.80	36.20	24.40	27.50	24.40	16″ from 14″ stk.		21.50	24.60	32.20	16″ from 14″ stk.	29.70	1.875″ x.290″	29.70	.....	.....
18	.....	.....	32.90	36.20	.....	18″ from 15″ stk.		25.90	28.50	.....	.....	.....	.....	.....	.....	.....
20	.....	.....	.....	.....	.....	20″ from 16″ stk.		32.90	.....	.....	.....	.....	.....	.....	.....	.....

The above list comprises all the kinds, sizes and cuts of Files regularly stocked. All others are special.

SWISS PATTERN FILES

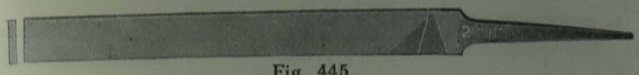


Fig. 445

HAND

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	1/2	$2.40	$2.50	$2.70	$3.00
4	7/8	2.60	2.75	3.05	3.70
5	1 1/2	2.95	3.25	3.65	4.55
6	2 3/8	3.45	3.85	4.45	5.40
8	4 7/8	5.00	5.45	6.15	7.35
10	9 1/8	6.60	7.45	8.40	9.80
12	14 1/4	8.70	10.05	11.15	12.90
14	21 7/8	11.40	13.40	14.70	17.00

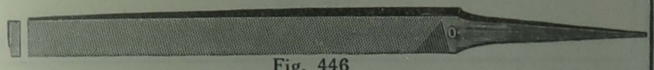


Fig. 446

PILLAR

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	1/4	$1.80	$2.00	$2.20	$2.65
3	3/8	1.80	2.00	2.20	2.65
3 1/2	1/2	1.80	2.00	2.20	2.65
4	5/8	1.80	2.00	2.20	2.65
5	1	1.90	2.10	2.35	2.90
6	1 5/8	2.00	2.25	2.65	3.30
8	3 5/8	2.95	3.25	3.70	4.45
10	6 5/8	4.20	4.55	5.10	6.00
12	11	5.80	6.15	7.00	8.00

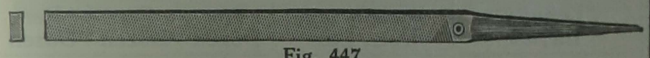


Fig. 447

PILLAR NARROW

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	3/16	$1.75	$1.95	$2.20	$2.60
3	1/4	1.75	1.95	2.20	2.60
3 1/2	3/8	1.75	1.95	2.20	2.60
4	1/2	1.75	1.95	2.20	2.60
5	7/8	1.85	2.05	2.30	2.70
6	1 1/4	1.95	2.15	2.40	2.90
8	2 5/8	2.70	3.05	3.50	4.30
10	5 3/16	3.70	4.25	5.05	6.35
12	8 3/4	4.90	5.70	7.15	9.50

Fig. 448

PILLAR EXTRA NARROW

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	3/16	$1.95	$2.00	$2.20	$2.55
4	5/16	1.95	2.00	2.20	2.55
5	3/4	1.95	2.10	2.40	2.80
6	1 5/8	2.00	2.25	2.70	3.10
8	1 15/16	2.60	2.90	3.40	4.25
10	3 11/16	3.50	4.00	4.80	6.15
12	6 3/16	4.70	5.70	7.30	9.40

All Above, Packed One Dozen in a Box.

SWISS PATTERN FILES

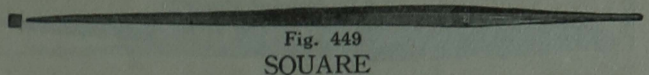


Fig. 449

SQUARE

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	1/16	$2.45	$2.50	$2.60	$2.70
3	1/8	2.45	2.50	2.60	2.70
3 1/2	3/16	2.50	2.65	2.90	3.05
4	3/16	2.55	2.70	3.15	3.40
5	3/8	2.80	3.15	3.80	4.25
6	5/8	3.20	3.60	4.55	5.30
8	2	3.95	4.75	6.15	7.60
10	4	5.00	6.10	8.00	10.00
12	8 3/4	6.30	8.00	10.15	12.50

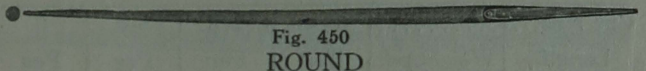


Fig. 450

ROUND

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	1/16	$1.80	$1.90	$2.05	$2.30
3	1/8	1.80	1.90	2.05	2.30
3 1/2	3/16	1.90	2.00	2.20	2.45
4	1/4	1.95	2.10	2.30	2.60
5	3/4	2.30	2.50	2.70	3.00
6	7/8	2.80	3.05	3.30	3.55
8	1 5/8	4.00	4.30	4.60	5.00
10	3	5.30	5.95	6.70	7.75
12	6 7/8	7.10	8.00	9.70	11.95

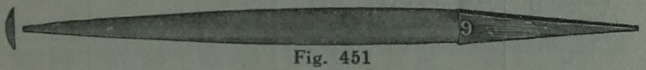


Fig. 451

HALF ROUND

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	1/8	$3.20	$3.60	$4.20	$5.25
3	1/4	3.20	3.60	4.20	5.25
3 1/2	5/16	3.40	3.95	4.55	5.80
4	3/8	3.65	4.30	4.90	6.30
4 1/2	1/2	3.90	4.65	5.30	6.90
5	3/4	4.20	5.00	5.70	7.50
6	1 1/4	4.85	5.80	6.65	8.70
7	2 1/4	5.70	6.65	7.70	9.90
8	3 1/4	6.75	7.80	9.00	11.10
10	6 3/8	9.35	10.35	11.80	13.80
12	10 5/8	12.50	13.30	15.05	18.30

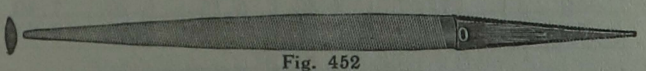


Fig. 452

CROSSING

Cut NOS.		00–0	1–2	3–4	6
Length, Inches	Weight Per Dozen, Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
2 1/2	1/8	$3.80	$4.15	$4.70	$5.55
3	1/4	3.80	4.15	4.70	5.55
4	5/8	4.05	4.50	5.25	6.30
5	1	4.50	5.10	6.00	7.40
6	1 5/8	5.40	6.10	7.10	8.85
8	4 3/4	7.80	8.60	9.70	11.90
10	8 1/4	10.50	11.65	13.00	15.50
12	13 1/4	13.50	15.00	17.00	20.00

All Above, Packed One Dozen in a Box.

SWISS PATTERN FILES

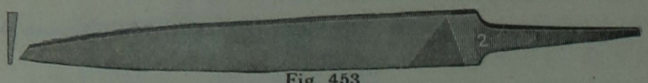


Fig. 453

KNIFE

Cut Nos...	.....	00–0	1–2	3–4	6
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	3/16	$2.80	$3.00	$3.40	$4.00
4	7/16	3.00	3.40	4.00	4.90
5	11/16	3.40	3.95	4.80	6.00
6	1	3.95	4.70	5.80	7.30
8	2 5/16	5.60	6.60	8.25	11.10

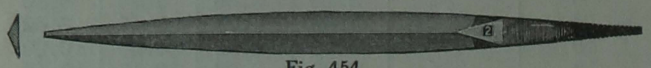


Fig. 454

BARRETTE

Cut Nos...	.....	00–0	1–2	3–4	6
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	1/4	$3.70	$3.80	$3.90	$4.05
3 1/2	3/8	3.80	3.90	4.00	4.15
4	9/16	3.90	3.95	4.10	4.25
5	7/8	4.10	4.20	4.35	4.55
6	1 7/16	4.45	4.55	4.75	5.05
8	2 7/8	5.85	6.00	6.25	6.65

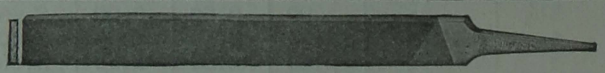


Fig. 455

EQUALING

Cut Nos...	.....	00–0	1–2	3–4	6
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	1/4	$2.25	$2.45	$2.70	$3.10
4	1/2	2.35	2.60	2.95	3.55
5	1	2.50	2.85	3.35	4.05
6	1 1/2	2.80	3.20	3.85	4.70
8	3 1/4	3.75	4.30	5.25	6.40

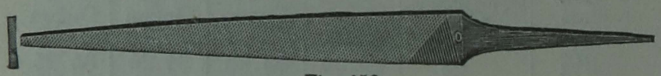


Fig. 456

WARDING

Cut Nos...	.....	00–0	1–2	3–4	6
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	3/16	$1.95	$2.00	$2.30	$2.65
4	1/4	2.25	2.55	2.90	3.40
5	1/2	2.70	3.10	3.60	4.25
6	1 3/8	3.20	3.75	4.35	5.20
8	1 5/8	4.45	5.15	6.20	7.40
10	4 1/16	5.90	6.75	8.25	9.85

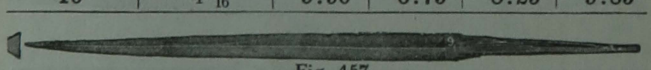


Fig. 457

THREE SQUARE

Cut Nos...	.....	00–0	1–2	3–4	6
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen	Per Dozen
3	3/16	$2.75	$2.95	$3.25	$3.75
3 1/2	5/16	2.75	2.95	3.25	3.75
4	3/4	2.75	2.95	3.25	3.75
5	11/16	2.95	3.15	3.50	4.05
6	2 1/8	3.25	3.50	3.95	4.55
8	4 5/8	4.35	4.70	5.30	6.10
10	7 5/8	5.85	6.30	7.20	8.30

All Above Packed One Dozen in a Box

SWISS PATTERN FILES

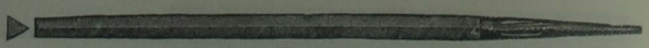


Fig. 458

METAL SAW

Cut Nos.....	.....	0	1–2	3–4
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen
3	3/16	$2.75	$2.95	$3.25
3 1/2	5/16	2.75	2.95	3.25
4	7/16	2.75	2.95	3.25
5	7/8	2.95	3.15	3.50
6	1 1/2	3.25	3.50	3.95
8	3 1/2	4.35	4.70	5.30

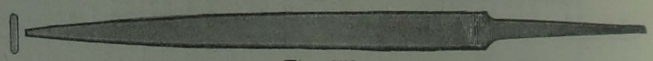


Fig. 459

CROCHET

Cut Nos.....	.....	00–0	1–2	3–4
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen
3	3/16	$3.55	$3.70	$4.20
4	3/8	4.30	4.60	5.00
5	3/4	5.10	5.45	5.90
6	1	6.00	6.40	6.85
8	2 5/16	7.95	8.45	9.00
10	4 3/16	10.10	10.70	11.30

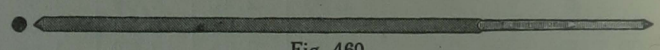


Fig. 460

ROUND STRAIGHT

Cut Nos.....	.....	00–0	2	4
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen
4	1/4	$1.80	$2.00	$2.20
5	7/16	2.30	2.60	2.90
6	7/8	3.00	3.40	3.80
8	1 1/4	4.80	5.30	5.80

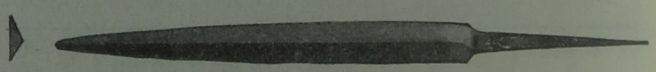


Fig. 461

CANT

Cut Nos.....	.....	00–0	2	4
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen
3	1/4	$4.60	$5.20	$6.05
4	7/16	4.75	5.35	6.25
5	5/8	5.00	5.65	6.60
6	1	5.45	6.15	7.10

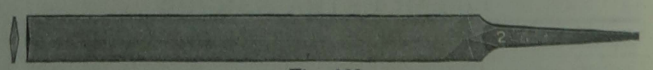


Fig. 462

SLITTING

Cut Nos.....	.....	00–0	2	4
Length, Inches	Weight per Doz., Lbs.	Per Dozen	Per Dozen	Per Dozen
4	3/8	$4.25	$5.40	$6.50
5	5/8	5.30	6.40	7.50
6	13/16	6.50	7.65	8.75

All Above Packed One Dozen in a Box

NEEDLE OR ESCAPEMENT FILES

SQUARE HANDLE

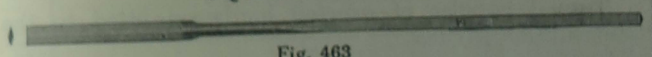


Fig. 463
SLITTING

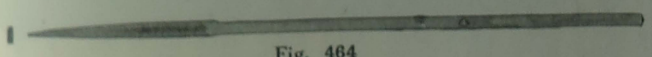


Fig. 464
FLAT

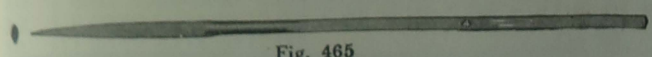


Fig. 465
OVAL

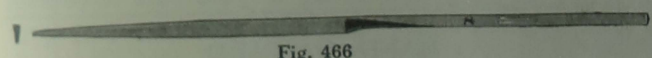


Fig. 466
KNIFE

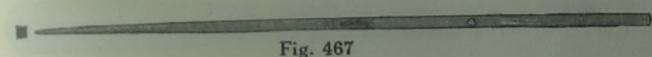


Fig. 467
SQUARE

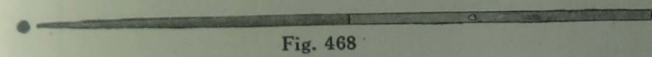


Fig. 468
ROUND

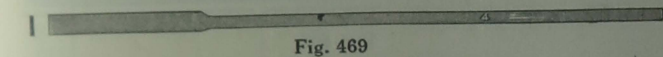


Fig. 469
EQUALLING

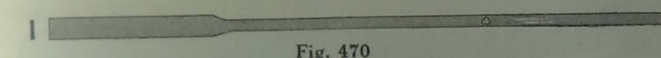


Fig. 470
JOINT

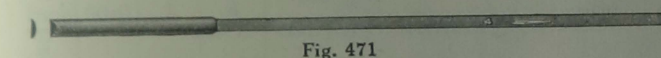


Fig. 471
HALF ROUND BLUNT

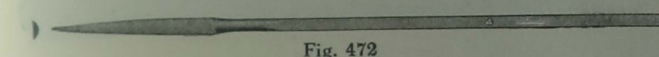


Fig. 472
HALF ROUND

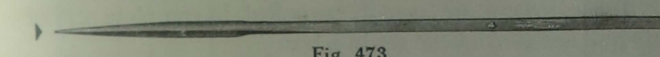


Fig. 473
BARRETTE

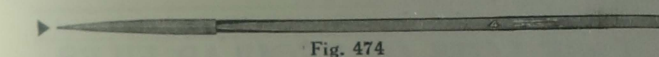


Fig. 474
THREE SQUARE

Cuts Nos. 0—2—4—6.

Style	Length Inches	Weight Per Dozen Lbs.	Per Dozen
Slitting	5½	¼	$2.70
Flat	5½	¼	2.60
Oval	5½	¼	2.30
Knife	5½	¼	2.90
Square	5½	¼	2.10
Round	5½	¼	1.70
Equalling	5½	¼	2.45
Joint	5½	¼	2.20
Half Round Blunt	5½	¼	2.35
Half Round	5½	¼	2.30
Barrette	5½	¼	2.15
Three Square	5½	¼	2.45
Assorted			2.35

NEEDLE FILES

ROUND HANDLE

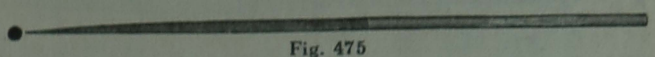


Fig. 475
ROUND

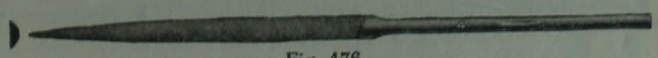


Fig. 476
HALF ROUND

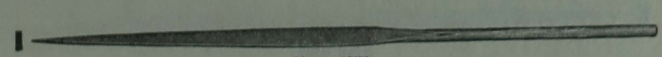


Fig. 477
FLAT

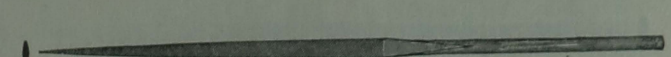


Fig. 478
OVAL

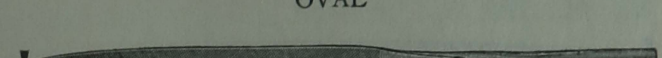


Fig. 479
KNIFE

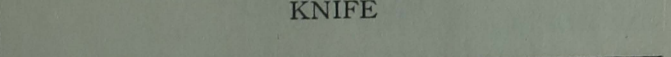


Fig. 480
SQUARE

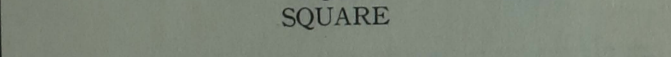


Fig. 481
THREE SQUARE

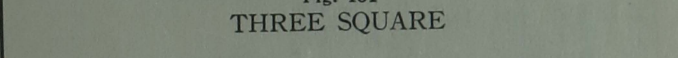


Fig. 482
EQUALLING

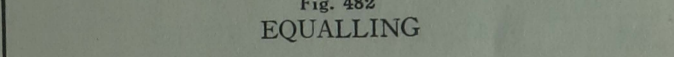


Fig. 483
BARRETTE

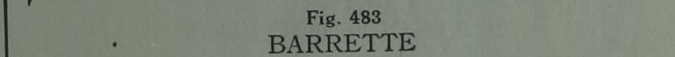


Fig. 464
JOINT

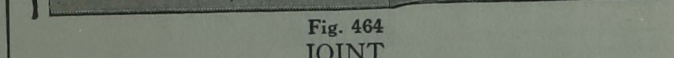


Fig. 485
SLITTING

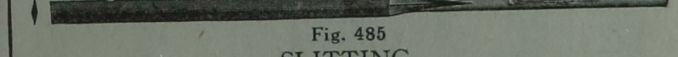


Fig. 486
MARKING

Cuts Nos. 0—2—4—6.

Style	4 Inch Per Doz.	4¾ Inch Per Doz.	5½ Inch Per Doz.	6¼ Inch Per Doz.
Round	$1.50	$1.60	$1.65	$1.75
Half Round	1.75	2.15	2.55	2.85
Flat	1.75	1.90	2.30	2.55
Oval	1.85	2.05	2.25	2.45
Knife	2.05	2.35	2.70	3.15
Square	1.85	2.00	2.15	2.30
Three Square	1.90	2.20	2.60	3.10
Equalling	1.85	2.10	2.40	2.65
Barrette	1.70	1.90	2.15	2.35
Joint	1.60	1.65	1.70	1.75
Slitting	2.35	2.65	3.00	3.30
Marking	1.75	1.85	1.95	2.05
Assorted	1.80	2.05	2.30	2.50

DIE SINKERS' FILES

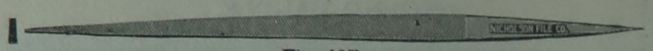


Fig. 487
FLAT

Fig. 488
AURIFORM

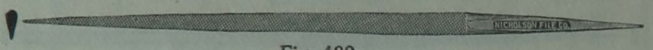


Fig. 489
OVAL—ONE SHARP EDGE

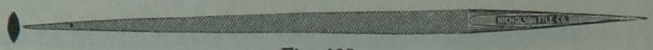


Fig. 490
OVAL

Fig. 491
HALF ROUND

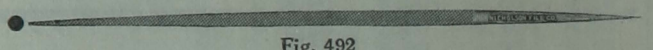


Fig. 492
ROUND

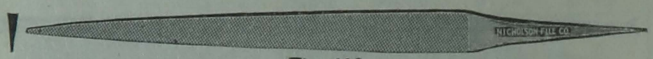


Fig. 493
KNIFE

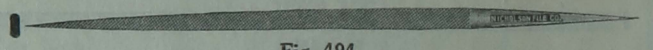


Fig. 494
FLAT—TWO ROUND EDGES

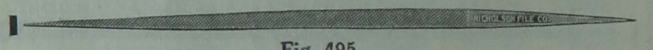


Fig. 495
FLAT—ONE SAFE EDGE

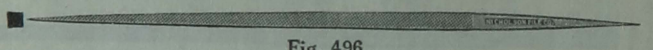


Fig. 496
SQUARE

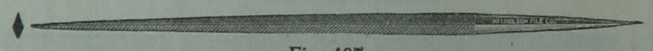


Fig. 497
LOZENGE

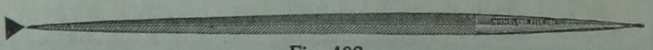


Fig. 498
THREE SQUARE

CUTS NOS. 0–2

Style	Length, Inches	Weight Per Dozen, Lbs.	Per Dozen
Flat	3½	¼	$2.50
Auriform	3½	¼	4.55
Oval—1 Sharp Edge	3½	¼	3.35
Oval	3½	¼	3.35
Half Round	3½	¼	3.15
Round	3½	¼	2.30
Knife	3½	¼	3.65
Flat—2 Round Edges	3½	¼	3.50
Flat—1 Safe Edge	3½	¼	2.30
Square	3½	¼	2.50
Lozenge	3½	¼	4.15
Three Square	3½	¼	2.65
Assorted	3½	.....	3.15

BENT RIFFLERS

HANDLED

Turned handles of selected hardwood fitted to the Riffles; spun ferrules.

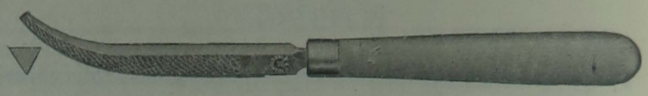


Fig. 499
THREE SQUARE—BASTARD

Fig. 500
HAND—BASTARD

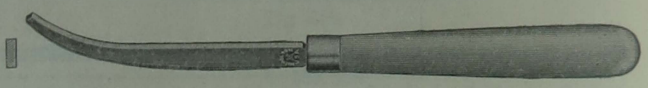


Fig. 501
FLAT FLOAT—SAFE SIDES

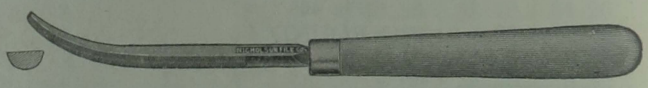


Fig. 502
HALF ROUND—BASTARD

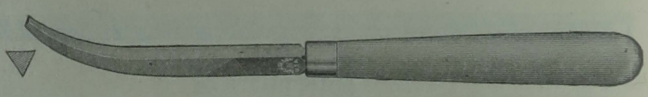


Fig. 503
THREE SQUARE—RASP

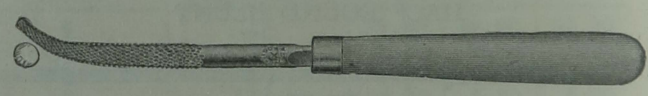


Fig. 504
ROUND—RASP

These rifflers are usually supplied in complete sets of six and are packed one set in a box.

Per Set..... $3.00

CASE LOTS OF REGULAR FILES

NUMBER OF DOZEN IN A CASE.

Length, Inches	Mill	Flat	Hand	Half Round	Round	Square	Slim Taper
4	.....	.....	.....	.....	.....	.....	175
4½	.....	.....	.....	.....	.....	.....	175
5	.....	.....	.....	.....	.....	.....	100
5½	.....	.....	.....	.....	.....	.....	100
6	60	.....	.....	.....	.....	.....	100
7	50	.....	.....	.....	.....	.....	60
8	50	40	40	40	60	60	50
9	50	.....	.....	.....	.....	.....	.....
10	50	36	25	36	25	25	.....
12	25	20	19	20	25	25	.....
13	.....	.....	.....	.....	.....	.....	.....
14	18	14	12½	13½	16	16	.....
16	13½	10	10	10	10	10	.....
18	.....	6	.....	.....	.....	.....	.....

SWISS PATTERN FILES

In Effect April 1, 1919 — PRICE PER DOZEN

Inch	Hand 00-0	Hand 1-2	Hand 3-4	Hand 6	Pillar 00-0	Pillar 1-2	Pillar 3-4	Pillar 6	Pillar, Narrow 00-0	Pillar, Narrow 1-2	Pillar, Narrow 3-4	Pillar, Narrow 6	Pillar, Extra Narrow 00-0	Pillar, Extra Narrow 1-2	Pillar, Extra Narrow 3-4	Pillar, Extra Narrow 6	Square 00-0	Square 1-2	Square 3-4	Square 6
2½	....	....	....	....	$1.80	$2.00	$2.20	$2.65	$1.75	$1.95	$2.20	$2.60	....	....	....	....	$2.45	$2.50	$2.60	$2.70
3	$2.40	$2.50	$2.70	$3.00	1.80	2.00	2.20	2.65	1.75	1.95	2.20	2.60	$1.95	$2.00	$2.20	$2.55	2.45	2.50	2.60	2.70
3½	....	....	....	....	1.80	2.00	2.20	2.65	1.75	1.95	2.20	2.60	....	....	....	....	2.50	2.65	2.90	3.05
4	2.60	2.75	3.05	3.70	1.80	2.00	2.20	2.65	1.75	1.95	2.20	2.60	1.95	2.00	2.20	2.55	2.55	2.70	3.15	3.40
5	2.95	3.25	3.65	4.55	1.90	2.10	2.35	2.90	1.85	2.05	2.30	2.70	1.95	2.10	2.40	2.80	2.80	3.15	3.80	4.25
6	3.45	3.85	4.45	5.40	2.00	2.25	2.65	3.30	1.95	2.15	2.40	2.90	2.00	2.25	2.70	3.10	3.20	3.60	4.55	5.30
8	5.00	5.45	6.15	7.35	2.95	3.25	3.70	4.45	2.70	3.05	3.50	4.30	2.60	2.90	3.40	4.25	3.95	4.75	6.15	7.60
10	6.60	7.45	8.40	9.80	4.20	4.55	5.10	6.00	3.70	4.25	5.05	6.35	3.50	4.00	4.80	6.15	5.00	6.10	8.00	10.00
12	8.70	10.05	11.15	12.90	5.80	6.15	7.00	8.00	4.90	5.70	7.15	9.50	4.70	5.70	7.30	9.40	6.30	8.00	10.15	12.50
14	11.40	13.40	14.70	17.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Inch	Round 00-0	Round 1-2	Round 3-4	Round 6	Half Round 00-0	Half Round 1-2	Half Round 3-4	Half Round 6	Crossing 00-0	Crossing 1-2	Crossing 3-4	Crossing 6	Knife 00-0	Knife 1-2	Knife 3-4	Knife 6	Barrette 00-0	Barrette 1-2	Barrette 3-4	Barrette 6
2½	1.80	1.90	2.05	2.30	3.20	3.60	4.20	5.25	3.80	4.15	4.70	5.55	....	....	....	....	....	....	....	....
3	1.80	1.90	2.05	2.30	3.20	3.60	4.20	5.25	3.80	4.15	4.70	5.55	2.80	3.00	3.40	4.00	3.70	3.80	3.90	4.05
3½	1.90	2.00	2.20	2.45	3.40	3.95	4.55	5.80	....	....	....	....	....	....	....	....	3.80	3.90	4.00	4.15
4	1.95	2.10	2.30	2.60	3.65	4.30	4.90	6.30	4.05	4.50	5.25	6.30	3.00	3.40	4.00	4.90	3.90	3.95	4.10	4.25
4½	....	....	....	....	3.90	4.65	5.30	6.90	....	....	....	....	....	....	....	....	....	....	....	....
5	2.30	2.50	2.70	3.00	4.20	5.00	5.70	7.50	4.50	5.10	6.00	7.40	3.40	3.95	4.80	6.00	4.10	4.20	4.35	4.55
6	2.80	3.05	3.30	3.55	4.85	5.80	6.65	8.70	5.40	6.10	7.10	8.85	3.95	4.70	5.80	7.30	4.45	4.55	4.75	5.05
7	....	....	....	....	5.70	6.65	7.70	9.90	....	....	....	....	....	....	....	....	....	....	....	....
8	4.00	4.30	4.60	5.00	6.75	7.80	9.00	11.10	7.80	8.60	9.70	11.90	5.60	6.60	8.25	11.10	5.85	6.00	6.25	6.65
10	5.30	5.95	6.70	7.75	9.35	10.35	11.80	13.80	10.50	11.65	13.00	15.50	....	....	....	....	....	....	....	....
12	7.10	8.00	9.70	11.95	12.50	13.30	15.05	18.30	13.50	15.00	17.00	20.00	....	....	....	....	....	....	....	....

Inch	Equaling 00-0	Equaling 1-2	Equaling 3-4	Equaling 6	Warding 00-0	Warding 1-2	Warding 3-4	Warding 6	Three Square 00-0	Three Square 1-2	Three Square 3-4	Three Square 6	Metal Saw 0	Metal Saw 1-2	Metal Saw 3-4	Metal Saw ____	Crochet 00-0	Crochet 1-2	Crochet 3-4	Crochet ____
3	2.25	2.45	2.70	3.10	1.95	2.00	2.30	2.65	2.75	2.95	3.25	3.75	2.75	2.95	3.25	....	3.55	3.70	4.20	....
3½	....	....	....	....	....	....	....	....	2.75	2.95	3.25	3.75	2.75	2.95	3.25	....	....	....	....	....
4	2.35	2.60	2.95	3.55	2.25	2.55	2.90	3.40	2.75	2.95	3.25	3.75	2.75	2.95	3.25	....	4.30	4.60	5.00	....
5	2.50	2.85	3.35	4.05	2.70	3.10	3.60	4.25	2.95	3.15	3.50	4.05	2.95	3.15	3.50	....	5.10	5.45	5.90	....
6	2.80	3.20	3.85	4.70	3.20	3.75	4.35	5.20	3.25	3.50	3.95	4.55	3.25	3.50	3.95	....	6.00	6.40	6.85	....
8	3.75	4.30	5.25	6.40	4.45	5.15	6.20	7.40	4.35	4.70	5.30	6.10	4.35	4.70	5.30	....	7.95	8.45	9.00	....
10	....	....	....	....	5.90	6.75	8.25	9.85	5.85	6.30	7.20	8.30	....	....	....	....	10.10	10.70	11.30	....

Inch	Round Straight 00-0	Round Straight 2	Round Straight 4	Round Straight ____	Cant 00-0	Cant 2	Cant 4	Cant ____	Slitting 00-0	Slitting 2	Slitting 4	Slitting ____	Pippin 0	Pippin 1-2	Pippin 4	Pippin ____	Joint Rd. Edge 0-2	Joint Sq. Edge 0-2
3	....	....	....	....	4.60	5.20	6.05	....	....	....	....	....	3.55	3.70	4.20	....	2.15	1.75
4	1.80	2.00	2.20	....	4.75	5.35	6.25	....	4.25	5.40	6.50	....	4.30	4.60	5.00	....	2.40	2.00
5	2.30	2.60	2.90	....	5.00	5.65	6.60	....	5.30	6.40	7.50	....	....	....	....	....	2.85	2.60
6	3.00	3.40	3.80	....	5.45	6.15	7.10	....	6.50	7.65	8.75	....	6.00	6.40	6.85	....	3.40	3.25
8	4.80	5.30	5.80	....	....	....	....	....	....	....	....	....	7.95	8.45	9.00	....	4.80	4.55

ROUND HANDLE NEEDLE FILES — CUTS 0-2-4-6

Inch	Round	Hf. Rd.	Flat	Oval	Knife	Square	Thr. Sqr.	Equaling	Barrette	Joint	Slitting	Marking	Assorted
4	1.50	1.75	1.75	1.85	2.05	1.85	1.90	1.85	1.70	1.60	2.35	1.75	1.80
4¾	1.60	2.15	1.90	2.05	2.35	2.00	2.20	2.10	1.90	1.65	2.65	1.85	2.05
5½	1.65	2.55	2.30	2.25	2.70	2.15	2.60	2.40	2.15	1.70	3.00	1.95	2.30
6¼	1.75	2.85	2.55	2.45	3.15	2.30	3.10	2.65	2.35	1.75	3.30	2.05	2.50

SQUARE HANDLE NEEDLE OR ESCAPEMENT — CUTS 0-2-4-6

Inch	Round	Hf. Rd.	Flat	Oval	Knife	Square	Thr. Sqr.	Equaling	Barrette	Joint	Slitting	Hf. Rd. Blt.	Assorted
5½	1.70	2.30	2.60	2.30	2.90	2.10	2.45	2.45	2.15	2.20	2.70	2.35	2.35

DIE SINKERS' FILES — CUTS 0-2

Inch	Round	Hf. Rd.	Flat	Oval	Knife	Square	Thr. Sqr.	Flat 2 R. E.	Flat 1 S. E.	Oval 1 S. E.	Lozenge	Auriform	Assorted
3½	2.30	3.15	2.50	3.35	3.65	2.50	2.65	3.50	2.30	3.35	4.15	4.55	3.15

PARALLEL MACHINE FILES — CUTS 00-0-2

Inch	Round	Hf. Rd.	Pillar	Oval	Knife	Square	Thr. Sqr.	Crochet	Equaling	Pippin	Lozenge	Cant	Assorted
5	2.50	4.50	2.05	4.85	3.65	2.10	3.15	5.30	2.70	5.30	5.30	4.25	3.90

BENCH FILING MACHINE FILES — CUTS 00-0-2

Inch	Round	Hf. Rd.	Pillar	Oval	Knife	Square	Thr. Sqr.	Crochet	Equaling	Pippin	Lozenge	Cant	Assorted
3¼x⅛	1.80	3.20	2.50	2.80	3.20	3.00	2.90	3.40	3.30	3.20	3.50	3.20	3.00
3¼x¼	1.90	3.90	3.00	3.50	4.10	3.90	3.80	4.50	4.30	4.00	4.70	4.10	3.80

Screw Head with or without Tang, 3″	2.85
Broach, Gauge 40 to 65	1.35

Inches	3	4	5	6	8
Thickness of Drill or Joint — Thin	.02	.04	.06	.08	.10
Thickness of Drill or Joint — Thick	.06	.08	.10	.12	.14

Inches	2½	3	3½	4	5	6	8	10	12	14
Width in Decimal parts of an inch stated as near as practicable. Hand	....	.43	....	.53	.62	.72	.90	1.09	1.27	1.45
Pillar	.26	.29	.32	.35	.42	.48	.60	.73	.85	....
Pillar Narrow	.19	.22	.24	.27	.31	.36	.45	.55	.64	....
Pillar Ex. Narrow	....	.14	....	.18	.21	.24	.30	.36	.42	....

Pillar, Pillar Narrow, and Pillar Extra Narrow, with one or both edges cut, take same list price as with two safe edges. Other regular widths not listed take regular list prices.

The above list comprises all of the kinds, sizes and cuts of files that will be regularly carried in stock. Anything differing from these files will be considered as special.

FILE HANDLES

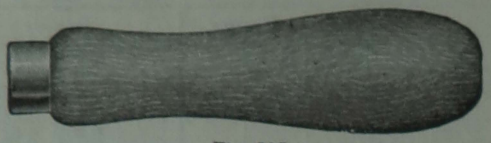


Fig. 505

HARDWOOD—SPUN FERRULES

A hardwood handle, turned to a convenient shape, with spun brass ferrules.

NOS.	4	3	2
Largest Diameter, Inches	1½	1⅜	1¼
For Files, Inches	4 to 6	6 to 8	8 to 10
Length, Inches	4	4½	5
Weight per Dozen, Lbs.	¾	1	1¼
Per Dozen	**$1.75**	**2.00**	**2.50**

NOS.	1	0	00
Largest Diameter, Inches	1⅛	1 1/16	1
For Files, Inches	10 to 12	12 to 14	14 to 16
Length, Inches	5½	6	6½
Weight per Dozen, Lbs.	1½	1¾	2
Per Dozen	**$3.00**	**3.50**	**4.00**

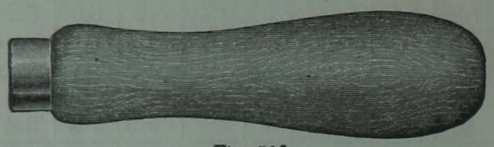


Fig. 506

SOFT WOOD

Turned and finished soft wood handle with brass ferrules.

NOS.	1	2	3	4	5
Largest Diameter, Inches	1 1/16	1⅛	1¼	1⅜	1½
Diameter of Ferrule, Inches	¾	11/16	⅝	½	⅜
Length, Inches	4¼	4½	4¾	5	5¼
Weight per Gross, Lbs.	8	13	18	22	27
Per Gross	**$4.00**	**4.00**	**4.00**	**5.00**	**5.00**

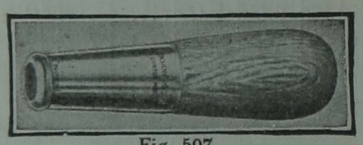


Fig. 507

DOCTOR

Turned hardwood handle smoothly finished; heavy pressed steel ferrule is enlarged at head and has an inwardly turned, curved, sharp-edged lip, which firmly locks the wooden portion within the enlarged end of the ferrule, when driven into place. Tapered hole fits the tang of the file.

NOS.	1	2	3	4	5
Largest Dia., Ins.	1	1⅛	1¼	1⅜	1½
For Files, Inches	4 to 6	6 to 10	10 to 14	14 to 18	18 to 20
Length, Inches	4	4¼	4½	4¾	5
Wgt. per Gr. Lbs.	30	36	42	48	54
Per Gross	**$6.00**	**7.00**	**8.00**	**9.00**	**10.00**

SOLDERING COPPER HANDLES

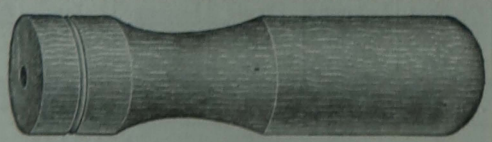


Fig. 508

Soft wood turned handle, bored, with end wired to prevent splitting.

Per Gross

NO. 200—5 Inches Long; 1⅜ Inches in Diameter; Weight per Dozen, 2½ Lbs. $3.90

FILE AND TOOL HANDLES

Fig. 509

Tinned iron handle and clamp; steel set screw, adjustable to hold any size small shank tool.

Per Dozen

NO. IXL—Length, 5 Inches. Weight per dozen, 4 Lbs. $2.00

FILE BRUSHES

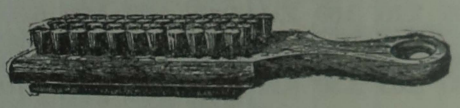


Fig. 510

File Brush with card and scorer. Hardwood frame with steel wire brush on one side and black bristles on reverse side.

Per Dozen

NO. 3—Length of Face 4¾ Inches; Width 1¼ Inches; Length Over All, 10 Inches; Weight per Dozen, 5 Lbs. ..... $

Price on Application.

FILE CARDS

Fig. 511

With scorer. Hardwood back and handle with steel wire card.

Per Dozen

NO. 1—Length of Face, 4¾ Inches; Width, 1½ Inches; Length Over All, 10 Inches; Weight per Dozen, 4 Lbs. ..... $

NO. 2—Without Scorer. Weight per Dozen, 3½ Lbs. ..... $

Prices on Application.

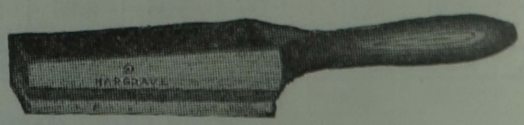


Fig. 512

Hardwood, neatly finished file cleaner; Teeth are tempered steel wire and will not turn over by coming in contact with file.

Per Dozen

NO. 364—10 Inches Long. Weight per Dozen, 5½ Lbs. $3.50

NO. 3641—Scorers for Above. Weight per Dozen, 5½ Lbs. 1.00

MEASURING TAPES

POCKET

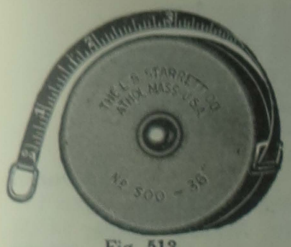


Fig. 513

A well finished full nickel plated case with rounded edges; spring wind; tape automatically rewinds upon pressing the center stop; black finish steel tape with etched markings.

¼ inch tape graduated in inches and 16ths.

NO. 500					
Length, Feet	3	5	6	8	10
Diam. Case, Inches	1 3/8	1 1/2	1 11/16	1 13/16	1 13/16
Weight Each, Ounces	2	2	3	3	10
Each	$0.75	.95	1.00	1.50	1.90

Nickel plated, highly finished steel case; folding handle with push button on opposite side, a slight pressure will instantly release handle; can be used with gloves on; black finish steel tape with bright markings; ⅜ inch steel tape; graduated in feet, inches and 8ths.

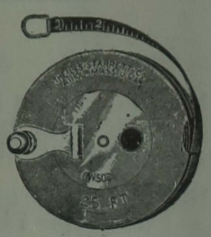


Fig. 514

NO. 505			
Length, Feet	25	33	50
Diam. Case, Inches	2 7/8	2 7/8	3 3/8
Weight Each, Ounces	7	11	12
Each	$3.70	4.00	4.50
Length, Feet	66	75	100
Diam. Case, Inches	3 1/2	3 7/8	4 1/2
Weight Each, Ounces	15	18	20
Each	$5.70	6.00	7.70

Fig. 515

Hard leather case with nickel plated folding handle and trimmings; push button opposite handle, a slight pressure will instantly release it; black finish tape with bright steel markings, ⅜ inch wide; graduated one side only, in feet, inches and 8ths.

NO. 510			
Length, Feet	25	33	50
Diam. Case, Inches	2 7/8	2 7/8	3 3/8
Weight Each, Ounces	8	9	13
Each	$4.10	4.40	5.00
Length, Feet	66	75	100
Diam. Case, Inches	3 1/2	3 7/8	4 1/2
Weight Each, Ounces	15	18	23
Each	$6.25	6.50	8.50

Hard leather case with nickel plated folding handle and trimmings; push button on opposite side, a slight pressure will instantly release the handle; black finish tape with bright steel markings; ¼ inch steel tape; marked feet, inches and 16ths.

Fig. 516

NO. 512				
Length, Feet	25	33	50	66
Diam. Case, Inches	2 1/4	2 1/2	2 7/8	3 3/8
Weight Each, Ounces	4	5	6	7
Each	$3.90	4.20	4.75	5.90

MEASURING TAPES

RELIABLE

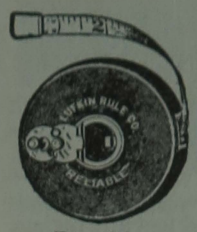


Fig. 517

Hard leather, metal lined case; nickel plated, double folding; flush handle and trimmings; opened by pressing opposite side of handle; measurements accurate; links and poles on back; ⅜ inch steel tape marked feet, inches and 8ths.

NOS.	200	201	203	204
Length, Feet	25	33	50	66
Diam. Case, Inches	2 3/4	3	3 1/4	3 3/4
Weight Each, Ounces	9	10	13	16
Each	$4.50	5.20	7.20	9.20
NOS.	205	206	207	208
Length, Feet	75	100	150	200
Diam. Case, Inches	4 1/4	4 1/2	5 1/4	6
Weight Each, Ounces	19	22	30	39
Each	$10.40	12.80	18.50	24.00

CHALLENGE

Hard leather, metal lined case; nickel plated folding, flush handle and trimmings; opened by pressing pin on opposite side of handle; ⅜ inch steel tape accurately graduated in feet, inches and 8ths, one side only.

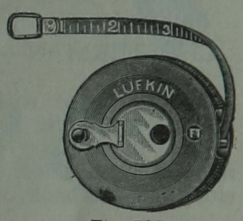


Fig. 518

NOS.	260	261	263
Length, Feet	25	33	50
Diam. Case, Inches	2 3/4	3	3 1/4
Weight Each, Ounces	7	8	12
Each	$3.25	3.50	4.00
NOS.	264	265	266
Length, Feet	66	75	100
Diam. Case, Inches	3 3/4	4 1/4	4 1/2
Weight Each, Ounces	14	17	21
Each	$5.00	5.25	6.75

METALLIC

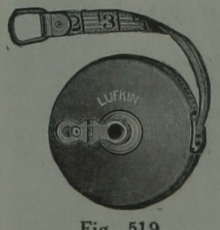


Fig. 519

Hard leather case, double folding handle; nickel plated trimmings; tape of best woven linen, with metallic warp; ⅝ inch tape marked inches one side only; less liable to shrink or stretch than common linen tapes.

NOS.	500	501	503
Length, Feet	25	33	50
Diam. Case, Inches	3 1/4	3 3/4	4
Weight Each, Ounces	8	10	13
Each	$1.70	2.00	2.50
NOS.	504	505	506
Length, Feet	66	75	100
Diam. Case, Inches	5	5	5 5/8
Weight Each, Ounces	15	17	21
Each	$2.80	3.10	3.90

MEASURING TAPES

Fig. 520

STERLING—LINEN

Hard leather case; flush handle; nickel plated trimmings; tape of pure linen, re-enforced with leather the first 4 inches. Tape 5/8 inch wide, marked feet and inches, one side only.

NOS.	400	401	403
Length, Feet	25	33	50
Diam. Case, Inches	3¼	3¾	4
Weight Each, Ounces	8	9	12
Each	**$1.25**	1.40	1.65

NOS.	404	405	406
Length, Feet	66	75	100
Diam. Case, Inches	5	5	5½
Weight Each, Ounces	14	16	19
Each	**$1.95**	2.10	2.50

CHESTERMAN—METALLIC

Leather case with brass trimmings and folding handle; metallic woven linen tape 5/8 inch wide, marked both sides, inches on one side, links on back.

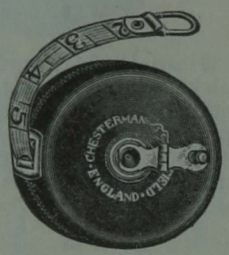


Fig. 521

NO. 34L

Length, Feet	25	33	50
Diam. Case, Inches	3	3	4
Weight Each, Ounces	6	8	11
Each	**$1.80**	2.10	2.60

Length, Feet	66	75	100
Diam. Case, Inches	4½	4¾	5½
Weight Each, Ounces	14	15	19
Each	**$3.00**	3.30	4.20

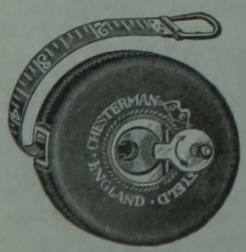


Fig. 522

CHESTERMAN—STEEL

Hard leather case; double folding handle and trimmings nickel plated; 3/8 inch steel tape, marked feet, inches and 8ths on one side, links on back.

NO. 1038L

Length, Feet	25	33	50
Diam. Case, Inches	2¼	2½	3
Weight Each, Ounces	6	7	10
Each	**$4.50**	5.20	7.20

Length, Feet	66	75	100
Diam. Case, Inches	3¼	3¾	4¼
Weight Each, Ounces	13	14	17
Each	**$9.20**	10.40	12.80

All Above, One in a Box

BOXWOOD FOLDING RULES

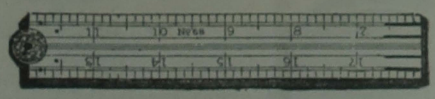


Fig. 523

Per Dozen

NO. 68—2 Foot, 4 Fold; 1 Inch Wide; Graduated in 8ths and 16ths; Round Joint, Middle Plates; Weight per Dozen, 1½ Lbs. $3.00

NO. 61—Similar to No. 68, but with Square Joints; Weight per Dozen, 1½ Lbs 3.60

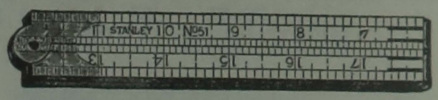


Fig. 524

Per Dozen

NO. 51—2 Foot, 4 Fold; 1 Inch Wide; Graduated in 8ths, 10ths, 12ths and 16ths, Drafting Scales; Arch Joint; Middle plates; Weight per dozen, 1½ Lbs. $4.20

NO. 53—Similar to No. 51 but with Edge Plates; Weight per Dozen, 1½ Lbs. 5.40

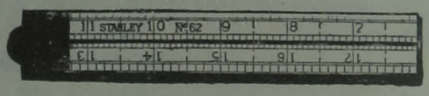


Fig. 525

Per Dozen

NO. 62—2 Foot; 4 Fold; 1 Inch Wide; Graduated in 8ths, 10ths, 12ths and 16ths; Drafting Scales; Square Joint; Full Bound; Weight per Dozen, 2¼ Lbs. $9.60

NO. 84—Similar to No.6 2, but only Half Bound; Weight per Dozen, 2 Lbs. 7.80

BOXWOOD CALIPER RULES

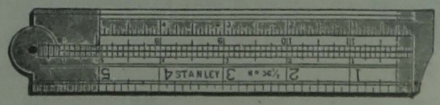


Fig. 526

Per Dozen

NO. 36½—1 Foot; 2 Fold; Square Joint; 1⅜ Inches Wide; Graduated in 8ths, 10ths, 12ths and 16ths; Weight per Dozen, 1¾ Lbs. $7.80

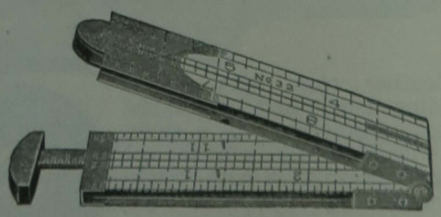


Fig. 527

Per Dozen

NO. 32—1 Foot; 4 Fold; Arch Joint; Edge Plates; 1 Inch Wide; Graduated 8ths, 10ths, 12ths, and 16ths; Weight Per Dozen, 1¼ Lbs. $8.30

All Above, One-half Dozen in a Box

ZIGZAG RULES

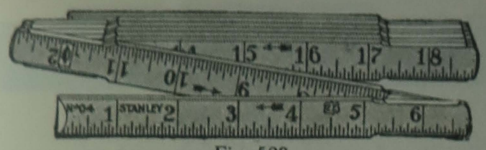


Fig. 528

Flexible hardwood with concealed joints and patented strike plates. Joint tips and strike plates are brass plated. 5/8 Inch wide; 6 Inch Folds.

YELLOW ENAMELED

NOS.	02	03	04
Length, Feet	2	3	4
Weight per Dozen, Lbs.	1	1½	2
Per Dozen	$3.20	4.80	6.40
NOS.	05	06	08
Length, Feet	5	6	8
Weight per Dozen, Lbs.	2¾	3¼	4¼
Per Dozen	$8.00	9.60	12.80

WHITE ENAMELED

NOS.	102	103	104
Length, Feet	2	3	4
Weight per Dozen, Lbs.	1	1½	2
Per Dozen	$3.40	5.10	6.80
NOS.	105	106	108
Length, Feet	5	6	8
Weight per Dozen, Lbs.	2¾	3¼	4¼
Per Dozen	$8.50	10.20	13.60

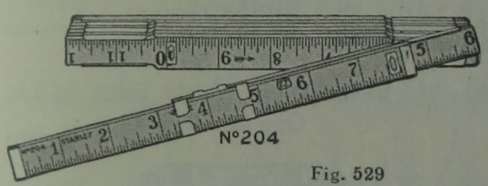


Fig. 529

EXTENSION

Yellow enamel finish, flexible hardwood; brass plated joints and tips; 5/8 inch wide, 6 inch folds.

NOS	204	206
Length, Feet	4	6
Weight per Dozen, Lbs.	3	4
Per Dozen	$9.00	13.50

TRY AND MITRE SQUARES

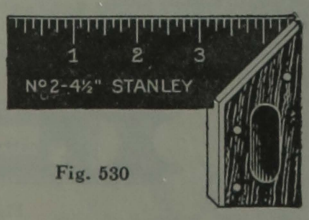


Fig. 530

Polished rosewood handle with handy groove; brass inside edge plate attached to handle with screws; rolled steel blade; blued finish; figures and lines, stamped; graduated in inches and eighths; blade inserted in handle and secured with two iron rivets.

NO. 2

Length Blade, Inches	4½	6	7½	9	12
Width Blade, Inches	1¾	1⅝	1⅞	1⅞	1 15/16
Length Handle, Inches	3⅛	4	5	5¾	5¾
Weight per Dozen, Lbs.	2	4½	6	6	7
Per Dozen	$9.00	10.20	12.00	14.40	18.00

All Above, One-half Dozen in a Box

TRY SQUARES

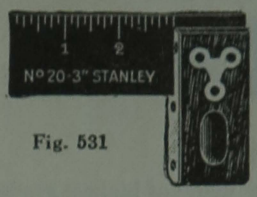


Fig. 531

Polished rosewood handle with handy groove; brass inside edge plate attached with blued screws, rolled steel blade, blued finish; figures and lines, stamped; graduated in inches and eighths; blade inserted in handle and secured with three iron rivets and brass flush burrs.

NO. 20

Length Blade, Inches	3	4½	6	7½	8
Width Blade, Inches	1 1/16	1½	1½	1⅝	1 11/16
Length Handle, Inches	2⅞	3½	4⅝	5⅜	5⅜
Weight per Dozen, Lbs.	1½	3¼	4	6	6½
Per Dozen	$5.85	6.60	9.00	9.60	10.20

Length Blade, Inches	9	10	12	15	18
Width Blade, Inches	1¾	1¾	1⅞	2	2⅛
Length Handle, Inches	6	6	7	7	9¾
Weight per Dozen, Lbs.	7	8	10	10	15½
Per Dozen	$12.60	13.20	16.80	21.00	27.60

BEVELS

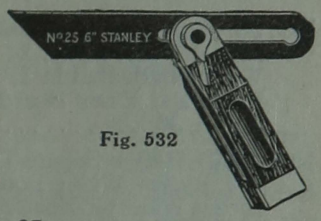


Fig. 532

Rosewood stock with brass tips and flush Lever; steel blade blued finish; handy groove in handle. Pointed end of blade folds into handle.

NO. 25

Length Blade, Inches	6	8	10	12	14
Weight per Dozen, Lbs.	2½	3	4	6	7
Per Dozen	$7.55	8.40	9.00	9.85	10.80

All Above, One-half Dozen in a Box

STANDARD STEEL SQUARES

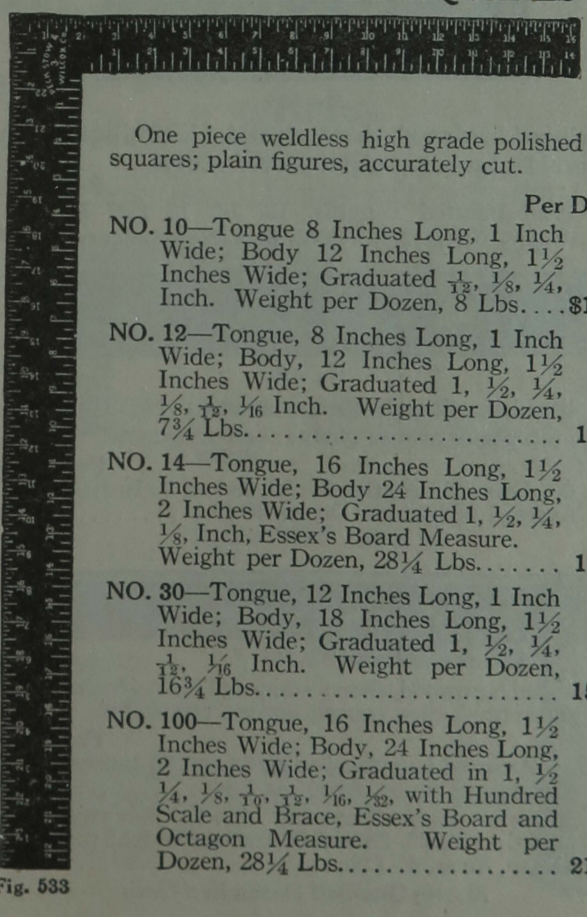


Fig. 533

One piece weldless high grade polished steel squares; plain figures, accurately cut.

Per Dozen

NO. 10—Tongue 8 Inches Long, 1 Inch Wide; Body 12 Inches Long, 1½ Inches Wide; Graduated 1/12, 1/8, 1/4, Inch. Weight per Dozen, 8 Lbs. **$11.00**

NO. 12—Tongue, 8 Inches Long, 1 Inch Wide; Body, 12 Inches Long, 1½ Inches Wide; Graduated 1, ½, ¼, 1/8, 1/12, 1/16 Inch. Weight per Dozen, 7¾ Lbs. **12.50**

NO. 14—Tongue, 16 Inches Long, 1½ Inches Wide; Body 24 Inches Long, 2 Inches Wide; Graduated 1, ½, ¼, ⅛, Inch, Essex's Board Measure. Weight per Dozen, 28¼ Lbs. **15.00**

NO. 30—Tongue, 12 Inches Long, 1 Inch Wide; Body, 18 Inches Long, 1½ Inches Wide; Graduated 1, ½, ¼, 1/12, 1/16 Inch. Weight per Dozen, 16¾ Lbs. **15.00**

NO. 100—Tongue, 16 Inches Long, 1½ Inches Wide; Body, 24 Inches Long, 2 Inches Wide; Graduated in 1, ½ ¼, 1/8, 1/10, 1/12, 1/16, 1/32, with Hundred Scale and Brace, Essex's Board and Octagon Measure. Weight per Dozen, 28¼ Lbs. **21.00**

TAKE-DOWN SQUARES

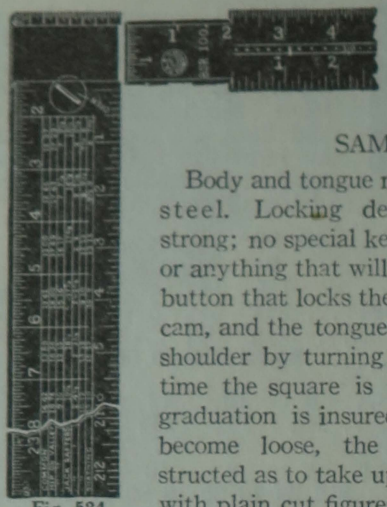


Fig. 534

SAMSON

Body and tongue made of highest grade steel. Locking device is simple and strong; no special key needed, just a coin or anything that will fit the groove of the button that locks the tongue. Works on a cam, and the tongue is drawn against the shoulder by turning the button. Every time the square is put together perfect graduation is insured. Should the joint become loose, the button is so constructed as to take up the wear. Polished with plain cut figures.

Per Dozen

NO. S3—Standard Tongue, 16 Inches Long; 1½ Inches Wide; Body, 24 Inches Long, 2 Inches Wide; Graduated in 1, ½, ¼, ⅛, 1/12, 1/16 Inch Brace and Essex Board Measure; Weight per Dozen, 36 Lbs. $39.00

NO. S100—Rafter Square Tongue, 16 Inches Long, 1½ Inches Wide; Body, 24 Inches Long, 2 Inches Wide; Graduated in 1, ½, ¼, ⅛, 1/10, 1/12, 1/16, 1/32 with Hundred Scale and Rafter, Brace, Essex Board and Octagon Measure; Weight per Dozen, 36 Lbs. 42.00

One in a Waterproof Canvas Case

PLUMBS AND LEVELS

Fig. 535

Polished hardwood, cherry stained, 1¼x2⅜ inches; non-adjustable; brass top plate; proved glasses.

Per Dozen

NO. 104—Assorted Lengths, 12, 14, 16 and 18 Inches; Weight per Dozen, 15 Lbs. $11.00

Fig. 536

Polished hardwood, cherry stained; 1⅜x3⅛ inches; brass top plate; proved glasses; non-adjustable.

Per Dozen

NO. 0—Assorted Lengths, 24, 26, 28 and 30 Inches; Average Weight per Dozen, 40 Lbs. $16.30

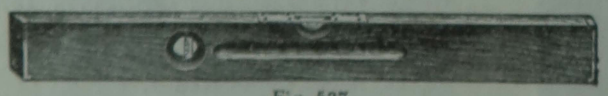


Fig. 537

Polished hardwood, cherry stained; 1⅜x3⅛ inches; brass top plate; brass tips; proved glasses, adjustable.

Per Dozen

NO. 3—Assorted Lengths, 24, 26, 28 and 30 Inches; Weight per Dozen, About 44 Lbs. $28.60

NO. 5—Brass Lips; Three-Ply Stock; Assorted Lengths, 24, 26, 28 and 30 Inches; Weight per Dozen, About 48 Lbs. 37.55

Above, One-half Dozen in a Case

PLUMBS AND LEVELS

Fig. 538

DUPLEX

Per Dozen

NO. 30—Polished hardwood, cherry stained; arch top plate; improved duplex side views; brass tips; assorted lengths, 24, 26, 28 and 30 inches; 1⅜x3⅛ Inch Stock; Weight per Dozen, About 48 Lbs. $37.55

Fig. 539

MACHINISTS

Cast iron body; nickel plated; steel top; polished faces; proved glasses set in plaster.

NOS.	38½	39½
Length, Inches	4	6
Weight per Dozen, Lbs.	3¼	7
Per Dozen	$8.85	10.70

All Above, One-half Dozen in a Box

Fig. 540

BENCH

Cast iron, japanned, with polished base.

Each

NO. 130—3½ Inches Long; Weight Each, ¼ Lb. $0.60

One in a Box

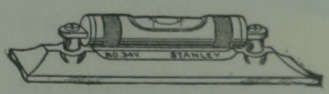


Fig. 541

Nickel plated cast iron base; steel case; ground glass; when not in use the glass can be covered by simply turning the outer shell of the case. "V" bottoms for shafting and round materials.

NO. 34V

Length, Inches	4	6	8	10
Weight Each, Lbs.	⅜	¾	1⅛	1¾
Each	$1.30	1.65	2.20	2.40

One in a Box

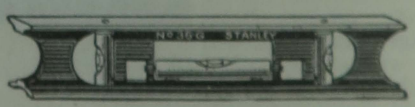


Fig. 542

METALLIC

Japanned cast iron frame; nickel plated trimmings, polished edge; proved glasses inclosed in nickel plated steel cases; glasses easily removed or adjusted; two plumbs and one level glass. Grooved bottoms for shafting and round material.

NO. 36 G

Length, Inches	6	9	12	18	24
Weight Each, Lbs.	1	1¼	1⅜	3	4 1/16
Each	$2.10	2.50	2.95	3.50	4.00

PLUMBS AND LEVELS

Fig. 543

BENCH

Double plumbs; concave groove, entire length of base, leaving a flat margin on each side, which improves the seat for flat work and gives a reliable seat for cylindrical work.

NO. 132

Length, Inches	4	6	9
Weight Each, Lbs.	3/8	7/8	1 1/4
Each	$1.65	1.80	2.00

Length, Inches	12	18	24
Weight Each, Lbs.	1 5/8	2 3/4	3 3/4
Each	$2.10	2.40	2.70

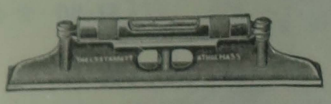


Fig. 544

ADJUSTABLE

Plain vials, set in tubes having solid ends which are firmly clamped to the base. Tubes nickel plated; bases japanned or nickel plated. Outer tube may be turned so as to protect glass when not in use. Longitudinal groove in base for cylindrical work.

NO. 95

Length, Inches	4	6	8	12	18
Weight Each, Lbs.	1/2	1	1 3/8	3 1/4	5 1/4
Each, Japanned	$1.20	1.50	1.80	2.40	3.60
Each, Nickeled	$1.55	1.85	2.15	2.75	3.95

NO. 96

Similar to No. 95, but with ground and graduated vial.

Length, Inches	4	6	8	12	18
Weight Each, Lbs.	1/2	1	1 3/8	3 1/4	5 1/4
Each, Japanned	$3.00	4.20	4.80	6.60	9.60
Each, Nickeled	$3.35	4.55	5.15	6.95	9.95

Note.—Nos. 95 and 96 are furnished with plumb 12 inch size; double plumb, 18 inch size.

Fig. 545

IMPROVED

For testing shaftings, etc., In addition to the parallel vial, bases have a cross level which enables one to place the base on a shaft level in its cross section, not canted sidewise. Base has concave groove.

NO. 97

Length, Inches	6	8	12	18
Weight Each, Lbs.	7/8	1 1/2	3 1/4	5 1/4
Each	$2.10	2.40	3.00	4.20

NO. 98

Similar to No. 97 but with ground and graduated Vial.

Length, Inches	6	8	12	18
Weight Each, Lbs.	7/8	1 1/2	3 1/4	5 1/4
Each	$4.80	5.40	7.20	10.20

Note.—Nos. 97 and 98 are furnished with plumb, 12 inch size; double plumb 18 inch size.

All Above, One in a Box

PLUMBS AND LEVELS

Fig. 546

POCKET

Hexagon steel case; nickel plated proved glass.

NO. 135

Length, Inches	2 1/2	3 1/2
Weight per Dozen, Lbs.	3/4	1
Each	$0.50	0.60

Six in a Box

Fig. 547

ENGINEERS AND PLUMBERS

Adjustable, incline level, fixed level and a plumb. The hinged tube inside the working faces of the frame, carrying a level glass, is adjustable to the graduated scale, and shows any incline by 32ds to 2 inches to the foot without interfering with the plumb or level. Base is grooved for use on round Work.

NOS.	133A	133B	133C	133D
Length, Inches	10	15	10	15
Weight Each, Lbs.	1 7/8	2 1/2	1 7/8	2 1/2
Each	$3.30	3.60	6.90	7.20

Note.—A and B furnished with plain glasses; C and D with ground glasses.

One in a Box

CROSS-TEST LEVELS AND PLUMBS

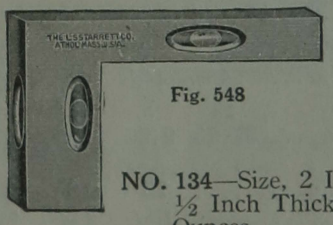


Fig. 548

Nickel plated case. For plumbing, squaring and leveling up work. Leveling is indicated every way without moving tool.

Each

NO. 134—Size, 2 Inch by 3 Inch, by 1/2 Inch Thick. Each Weight, 3 Ounces $1.80

CROSS-TEST LEVELS

Japanned iron; two levels, one frame, extending at right angles.

Fig. 549

Each

NO. 136—Length Each Way, 2 3/4 Inches; Weight Each, 4 Ounces $0.90

One in a Box

PLUMB BOBS

Fig. 550

Cast Iron, Japanned.

	Per Dozen
NO. 2—Length, 2⅝ Inches Diam. 1¾ Inches; Weight per Dozen, 7⅛ Lbs.	$1.45
NO. 21—Length 3⅜ Inches; Diam. 1⅞ Inches; Weight per Dozen, 16 Lbs.	2.40

Six in a Box

NO. 22—Length, 4 Inches; Diam. 2⅜ Inches; Weight per Dozen, 24 Lbs. 3.60

Packed Loose

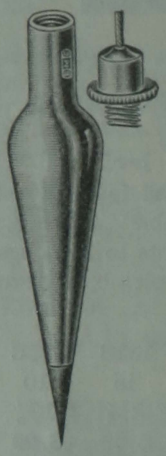


Fig. 551

No. 50—Long Neck

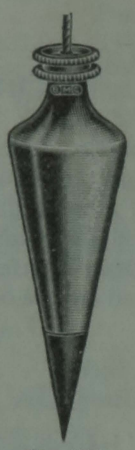


Fig. 552

No. 65—Short Neck

Cast from rich bronze metal; nicely finished and polished; hardened steel points screw into bronze body; cord is attached through hole in screw cap; plumb centers accurately.

NO. 50

Weight Each, Ounces	4	6	8	10
Length, Inches	4	4¼	4½	4¾
Diam., Inches	⅞	1	1¼	1 3/16
Per Dozen	$7.25	9.25	12.00	15.00

Weight Each, Ounces	12	16	24
Length, Inches	5¼	4¼	7¼
Diam., Inches	1⅜	1⅞	2
Per Dozen	$17.00	21.00	29.00

NO. 65

Weight Each, Ounces	4	6	8	10
Length, Inches	3½	3¾	4	4¼
Diam., Inches	⅞	1	1¼	1 3/16
Per Dozen	$7.25	9.25	12.00	15.00

Weight Each, Ounces	12	16	24
Length, Inches	4¾	4¼	6¾
Diam., Inches	1⅜	1⅞	2
Per Dozen	$17.00	21.00	29.00

One in a Box

PLUMB BOBS

Fig. 553

Made from solid steel, bored and filled with mercury. Noteworthy features are their great weight in proportion to size, low center of gravity and small diameter. Hardened and ground points, knurling on the body and the simple, effective device at top for fastening line without a knot, simply by drawing it into slotted neck at top. Nickel plated; provided with a braided silk line.

NO. 87

Length, Inches	4	5	5½	6
Diam., Inches	½	⅝	⅞	1
Weight each, Ounces	3½	6	12	16
Each	$1.80	2.40	3.00	3.60

NO. 177

Similar to No. 87 but without Mercury.

Length, Inches	4	5	5½	6
Diam., Inches	½	⅝	⅞	1
Weight Each, Ounces	2¾	5	8½	14½
Each	$0.90	1.20	1.80	2.40

All Above, One in a Box

MASONS LINES

High Grade, Soft Laid, Twisted Cotton Line.

	Per Dozen
¼ Lb. Balls	$
½ Lb. Balls	

Fig. 554

CHALK LINE REELS

Fig. 555

Polished, hardwood, Nos. 13 and 15 are furnished with 60 feet of strong, white cord. Nos. 14 and 15 include No. 1 Scratch awl.

NOS.	11	12	13	14	15
Length, Inches	4	3	3	3	3
Diam., Inches	2¼	2	2	2	2
Weight per Gross, Lbs.	24	12	18	25½	46½
Per Gross	$10.80	4.30	21.00	11.40	27.00

NO. 12—Three Dozen in a Package; All Others, One Dozen.

IRON BENCH PLANES

ADJUSTABLE

Japanned cast iron frame; varnished rosewood knob and handle; polished steel cap; tempered and polished tool steel cutter; screw and lever adjustment; plain bottoms.

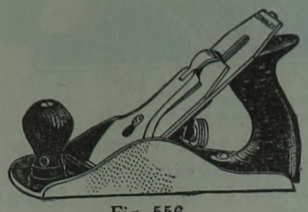


Fig. 556

SMOOTH

NOS.	1	2	3	4	4½
Length, Inches	5½	7	8	9	10
Cutter, Inches	1¼	1⅝	1¾	2	2⅜
Weight Each, Lbs.	1¼	2¼	3⅛	3¾	4¾
Each	$3.55	4.60	4.80	5.25	6.05

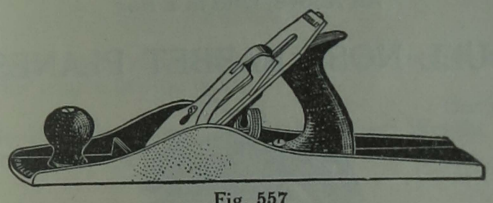


Fig. 557

JACK—FORE—JOINTER

NOS.	5	5½	6	7	8
Plane	Jack	Jack	Fore	Jointer	Jointer
Length, Inches	14	15	18	22	24
Cutter, Inches	2	2¼	2⅜	2⅝	2⅝
Weight Each, Lbs.	4¾	6¾	7¾	8⅛	9¾
Each	$6.05	6.75	7.70	8.80	10.50

WOOD BOTTOM BENCH PLANES

ADJUSTABLE

Varnished beechwood bottom, knob and handle, japanned cast iron frame and cap; tempered tool steel cutter, ground and polished; screw and lever adjustment.

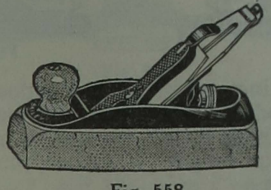


Fig. 558

UNHANDLED SMOOTH

NOS.	22	24	25
Length, Inches	8	8	9½
Cutter, Inches	1¾	2	1¾
Weight Each, Lbs.	2½	2⅞	2½
Each	$3.30	3.45	3.30

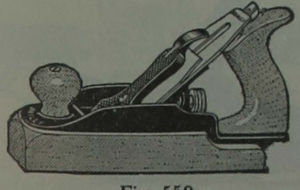


Fig. 559

HANDLED SMOOTH

NOS.	35	36	37
Length, Inches	9	10	13
Cutter, Inches	2	2⅜	2⅝
Weight Each, Lbs.	3¼	4	5
Each	$4.05	4.55	5.00

WOOD BOTTOM BENCH PLANES

ADJUSTABLE

Japanned cast iron frame; varnished rosewood knob and handle; polished steel cap; tempered and polished tool steel cutter; screw and lever adjustments; brass screws.

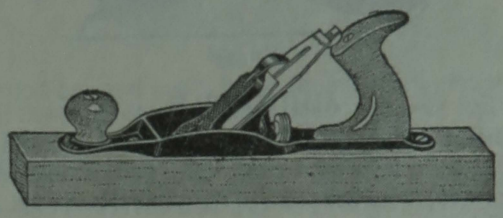


Fig. 560

JACK

NOS.	26	27½
Length, Inches	15	15
Cutter, Inches	2	2¼
Weight Each, Lbs.	3¾	4¾
Each	$3.60	4.15

FORE—JOINTER

NOS.	28	31	32
Length, Inches	18	24	26
Cutter, Inches	2⅜	2⅜	2⅝
Weight Each, Lbs.	5½	6½	7⅝
Each	$4.55	4.85	5.25

IRON BLOCK PLANES

Cast iron body; japanned inside, polished face and sides; tempered and polished tool steel cutter; brass adjusting nut quickly opens or closes throat for fine or coarse work. Blade can be adjusted both ways by means of nut and lever at back.

Fig. 561

ADJUSTABLE

Cast iron cap, japanned with cam lever adjustment.

	Each
NO. 9½—Length 6 Inches; Cutter, 1⅝ Inches; Weight Each, 1½ Lbs.	$2.45

Fig. 562

KNUCKLE JOINT

Fitted with new patented form of knuckle joint. Lever or cap being made entirely of steel makes it practically indestructible; nickel trimmings.

	Each
NO. 18—Length, 6 Inches; Cutter, 1⅝ Inches; Weight Each, 1½ Lbs.	$3.05
NO. 19—Length, 7 Inches; Cutter, 1⅝ Inches; Weight Each, 1⅝ Lbs.	3.25

All Above, One in a Box

IRON BLOCK PLANES

Fig. 563

ADJUSTABLE

Polished bottom and sides; cutter is made of high grade steel held by a lever and cam, and is adjustable endwise by a screw operated from rear of the plane; Rosewood Knob. Japan Trimmings.

	Each
NO. 220—Length, 7½ Inches; Cutter, 1⅝ Inches; Weight Each, 1½ Lbs.	$1.85

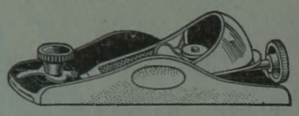


Fig. 564

LOW ANGLE—ADJUSTABLE

Body and cap of cast iron, polished on face and sides. Cutter of tool steel is held by a lever and cam and adjusted by a brass knurled screw at the back. Throat is quickly opened or closed to accommodate either fine or coarse work.

	Each
NO. 60—Nickel Trimmings; Length, 6 Inches; Cutter, 1⅜ Inches; Weight Each, 1¼ Lbs.	$2.85
NO. 60½—Japan Trimmings; Length, 6 Inches; Cutter, 1⅜ Inches; Weight Each, 1¼ Lbs.	2.60
NO. 65½—Japan Trimmings; Length, 7 Inches; Cutter, 1⅝ Inches; Weight Each, 1⅜ Lbs.	2.80

Fig. 565

NON-ADJUSTABLE

Ground face and sides; japanned cap and inside; applewood knob on front.

	Each
NO. 110—Length, 7½ Inches; Cutter, 1⅝ Inches; Weight Each, 1⅜ Lbs.	$1.25

Fig. 566

NON-ADJUSTABLE

Light serviceable plane; bottom is ground and sides japanned.

	Each
NO. 102—Length, 5½ Inches; Cutter, 1⅜ Inches; Weight Each, ⅞ Lb	$0.90

All Above One in a Box.

DADO PLANES

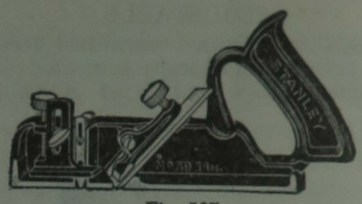


Fig 567

Japanned Iron frame and handle; the cutter is set on a skew; plane is fitted with a depth gauge adjustable by means of a thumb screw; is also provided with two adjustable spurs which can be adjusted to take up wear as well as for depth of cut.

NO. 39							
Length, Inches.	8	8	8	8	8	8	8
Size Cutter, Inches	¼	⅜	½	⅝	¾	⅞	1
Weight Each, Lbs.	1¾	1¾	1¾	2	2	2¼	2¼
Each	$3.85	4.05	4.30	4.50	4.70	4.90	5.10

All Above, One in a Box

BULL NOSE RABBET PLANES

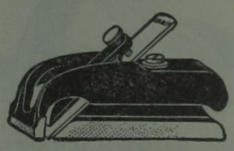


Fig. 568

Position of blade enables operator to work close up into corners. Mouth can readily be made to open or close by means of the screw on the top, which passes through a slot in the upper section of the stock; japan trimmings; extra quality tool steel cutter.

	Each
NO. 75—Length, 4 Inches; Cutter, 1 Inch; Weight Each, ⅝ Lb.	$0.90

All Above, One in a Box

SIDE RABBET PLANES

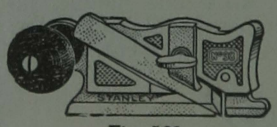


Fig. 569

Fig. 570

For side rabbeting and trimming dados; moulding and grooves of all kinds; a reversible nose piece will give the tool a form by which it will work close up into corners; hardwood handles; length 4 Inches; cutter, ½ Inch; Weight Each, ½ Lb.

	Each
NO. 98—Right Hand	$2.35
NO. 99—Left Hand	2.35

BELT MAKERS' PLANES

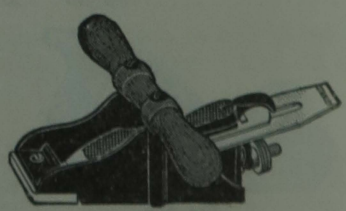


Fig. 571

Japanned cast iron; adjustable throat, hardwood handle designed or chamfering ends of belts.

	Each
NO. 11—Length, 5¾ Inches; 2⅜ Inch Cutter; Weight, 3½ Lbs.	$5.10

SPOKE SHAVES

DOUBLE IRON

Fig. 572

Japanned iron raised handle; cutter and cap iron, fastened by a thumb screw, to bring even pressure on cutter edge.

Per Dozen

NO. 51—10 Inches Long, 2⅛ Inch Cutter; Weight per Dozen, 8 Lbs. $5.40

ADJUSTABLE MOUTH

Fig. 573

Japanned iron, raised handle. Thumb screw adjusts mouth for coarse or fine work.

Per Dozen

NO. 53—10 Inches Long; 2⅛ Inch Cutter; Weight per Dozen, 8¾ Lbs. $6.95

TWO CUTTER

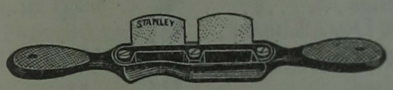


Fig. 574

Japanned iron, straight handle; two cutters and separate cutter seats, one hollow and one straight.

Per Dozen

NO. 60—10 Inches Long; 1½ Inch Cutter; Weight per Dozen, 8¾ Lbs. $6.95

DOUBLE IRON

Fig. 575

Japanned iron, straight handles. Designed for light work. Cutter and cap fastened by a thumb screw.

Per Dozen

NO. 64—9 Inches Long; 1¾ Inch Cutter; Weight per Dozen, 5½ Lbs. $3.15

All Above, Six in a Box

UNIVERSAL

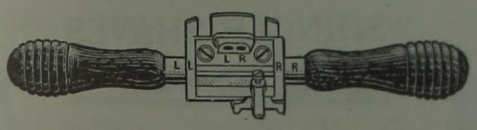


Fig. 576

Nickel Plated and polished frame; rosewood handles with Nickel Plated steel ferrules; tempered and polished tool steel adjustable cutter; two detachable bottoms for use on straight or circular surface.

Per Dozen

NO. 67—Length, 9½ Inches; Width of Cutter, 1⅞ Inches; Weight per Dozen, 8½ Lbs. $22.95

One in a Box

MARKING GAUGES

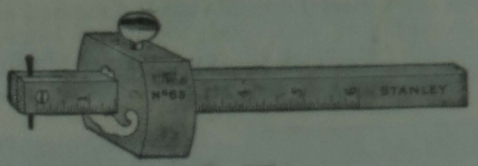


Fig. 577

Boxwood bar and head; brass thumb screw; brass plate in head; tempered steel marking point; securely locked by screw; but can be readily removed for sharpening; 6-inch scale graduated to sixteenths.

Per Dozen

NO. 65—Square Head; Length, 8½ Inches; Weight per Dozen, 4 Lbs. $8.30

One-half Dozen in a Box

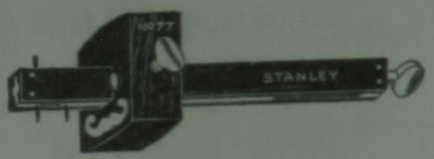


Fig. 578

SLIDE MORTISE

Polished Rosewood bar; graduated in inches and sixteenths; brass plate on head; brass thumb screw and shoe; three tempered steel points, one of which is adjusted by thumb screw at end of bar.

Per Dozen

NO. 77—Square Head; Length, 8½ Inches; Weight per Dozen, 5 Lbs. $15.35

MAGAZINE BRAD AWLS

Fig. 579

Polished Rosewood finish handle; four blades of different sizes fit in receptacle and go with each handle. Blades can not turn in, nor pull out of handle.

Per Dozen

NO. 1—Length over all, 4 Inches; Length of Blades, 1¼ to 2 Inches; Weight per Dozen, 2 Lbs. $6.00

Six in a Box

HANDLED SCRATCH AWLS

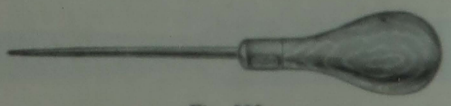


Fig. 580

Polished maple finish handle; needle point, steel blade.

Per Dozen

NO. 6—Length of Blade, 4 Inches; Length over all, 7 Inches; Weight per Dozen, 1 Lb. $3.00

TWISTED HANDLE AWLS

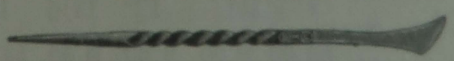


Fig. 581

Made of high grade tool steel. Blue finish. Cut shows No. 3 with one knife end. No. 2 has two straight ends.

NOS.	1	2	3
Length over all, Inches	7	7	7
Weight per Dozen, Lbs.	½	½	½
Per Dozen	$2.90	2.90	4.00

SOCKET FIRMER CHISELS

Forged from special crucible steel; tempered and hardened, ground and sharpened; sockets of Norway Iron; full polished. Handles are of seasoned white hickory, nicely polished and leather tipped.

Fig. 582

NO. 11

Blades 6 and 7 inches long.

Width, Inches	1/8	1/4	3/8	1/2	5/8	3/4
Weight per Doz., Lbs.	3½	4	4½	5	6½	7
Per Doz., Plain Back	$14.00	14.00	14.00	14.00	15.50	16.00
Per Doz., Bevel Back	14.65	14.65	14.65	14.65	16.15	16.65

Width, Inches	7/8	1	1¼	1½	1¾	2
Weight per Doz., Lbs.	7½	8	10½	12	14	15
Per Doz., Plain Back	$18.00	18.50	20.50	22.00	24.00	25.00
Per Doz., Bevel Back	18.65	19.15	21.15	22.65	24.65	25.65

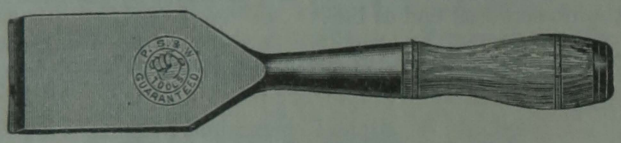


Fig. 583

NO. 71—BUTT CHISELS

Blade, 2½ inches long.

Width, Inches	1/4	1/2	3/4	1
Weight per Doz., Lbs.	2½	3¾	4¾	5¼
Per Doz., Plain Back	$14.00	14.00	16.00	18.50
Per Doz., Bevel Back	14.65	14.65	16.65	12.15

Width, Inches	1¼	1½	1¾	2
Weight per Doz., Lbs.	6	7	7½	8½
Per Doz., Plain Back	$20.50	22.00	24.00	25.00
Per Doz., Bevel Back	21.15	22.65	24.65	26.15

SOCKET FRAMING CHISELS

Fig. 584

Cut shows the oval back chisel. Framing chisels are furnished with iron ferruled handles instead of leather capped blade 8 inches long.

NO. 2

Width, Inches	1/4	3/8	1/2	5/8	3/4	7/8
Weight per Doz., Lbs.	8½	10½	12	13½	14	16
Per Doz., Oval Back	$9.00	9.00	9.00	9.50	10.00	10.50
Per Doz., Bevel Back	9.90	9.90	9.90	10.40	10.90	11.40

Width, Inches	1	1¼	1½	1¾	2
Weight per Doz., Lbs.	17½	23	26	29½	33
Per Doz., Oval Back	$11.00	12.00	13.00	14.50	16.00
Per Doz., Bevel Back	11.90	12.90	13.90	15.40	16.90

In Wooden Boxes, One-half Dozen

DECK CHISELS

Forged from special crucible steel; tempered and hardened, ground and sharpened; sockets of Norway Iron; full polished. Handles are of seasoned white hickory, nicely polished and leather tipped.

Fig. 585

NO. 42—OVAL BACK

Heavy chisels with iron ferruled handles. Length of blade, 6 Inches.

Width, Inches	1	1¼	1½	2
Weight per Doz., Lbs.	14	17	20	26
Per Doz.	$8.00	9.00	10.00	12.00

SOCKET FIRMER GOUGES

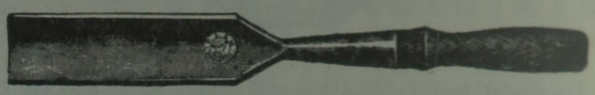


Fig. 586

NO. 131

Length of blade, 6 inches.

Width, Inches	1/8	1/4	3/8	1/2
Weight per Doz., Lbs.	3	4	4½	5
Per Doz.	$10.50	10.50	10.50	11.00

Width, Inches	5/8	3/4	7/8	1
Weight per Doz., Lbs.	5½	6	7½	8
Per Doz.	$11.50	12.25	13.25	14.00

Width, Inches	1¼	1½	1¾	2
Weight per Doz., Lbs.	10½	12	14	15
Per Doz.	$15.50	17.25	18.75	21.25

DRAWING KNIVES

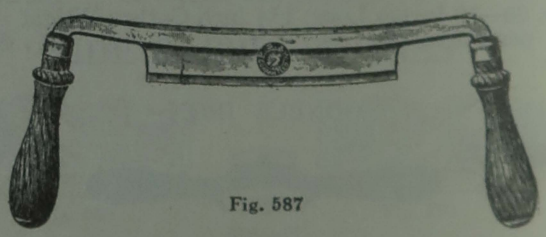


Fig. 587

Made from special crucible steel and Norway Iron, polished; fitted with heavy ferrules and metal capped handles.

NO. 15

Length, Inches	6	7	8
Weight per Doz., Lbs.	12	12½	13½
Per Doz.	$13.50	13.50	13.50

Length Inches	9	10	12	14
Weight per Doz., Lbs.	14	15	16½	18
Per Doz.	$14.40	15.60	18.00	21.00

SHINGLE SHAVES

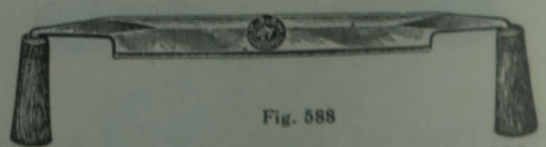


Fig. 588

Extra heavy; made of special crucible steel and Norway Iron; highly polished.

NO. 17

Length, Inches	6	8	9	10
Weight per Doz., Lbs.	11	15¾	18	19½
Per Doz.	$26.50	28.00	29.00	30.50

One-half Dozen in a Wooden Box

AUGER BITS

EXTENSION LIP

Fig. 589

Forged crucible tool steel; oil tempered; polished twist and stem; natural finish shank; double spur and extension lip double thread on screw; heads and cutters sharpened by hand; 4½-inch twist; 8½ inches over all.

NO. 100

Size, Inches, in 16ths	3	4	5	6	7
Weight per Dozen, Lbs.	¾	1⅛	1⅜	1½	1⅞
Per Dozen	$6.00	5.00	5.00	5.00	5.00
Size, Inches, in 16ths	**8**	**9**	**10**	**11**	**12**
Weight per Dozen, Lbs.	2⅛	2½	2⅞	3	3½
Per Dozen	$5.00	6.00	6.00	7.00	7.00
Size, Inches, in 16ths	**13**	**14**	**15**	**16**	**17**
Weight per Dozen, Lbs.	4	4½	4¾	5¼	6¼
Per Dozen	$8.25	8.25	9.50	9.50	12.00
Size, Inches, in 16ths	**18**	**19**	**20**	**21**	**22**
Weight per Dozen, Lbs.	7½	8	9¼	10½	11¾
Per Dozen	$12.00	14.00	14.00	16.00	16.00
Size, Inches, in 16ths	**23**	**24**	**25**	**26**	**27**
Weight per Dozen, Lbs.	13	14¼	15¼	16½	17¾
Per Dozen	$18.00	18.00	21.00	21.00	24.00
Size, Inches, in 16ths	**28**	**29**	**30**	**31**	**32**
Weight per Dozen, Lbs.	19	20½	21¾	23	23½
Per Dozen	$24.00	27.00	27.00	30.00	30.00

Up to 12/16, One Dozen in a Box; All Others, One-half Dozen in a Box

SNELL

Fig. 590

Extra quality crucible steel; oil tempered; polished; has two cutting edges with spurs and side lips; hand sharpened and finished; 4½-inch twist; 8½ inches over all.

NO. 200

Size, Inches, in 16ths	3	4	5	6	7
Weight per Dozen, Lbs.	1	1¼	1½	1¾	2
Per Dozen	$6.00	5.00	5.00	5.00	5.00
Size, Inches, in 16ths	**8**	**9**	**10**	**11**	**12**
Weight per Dozen, Lbs.	2¼	2¾	3	3¼	3¾
Per Dozen	$5.00	6.00	6.00	7.00	7.00
Size, Inches, in 16ths	**13**	**14**	**15**	**16**	**17**
Weight per Dozen, Lbs.	4	4½	5	5½	6¼
Per Dozen	$8.25	8.25	9.50	9.50	12.00
Size, Inches, in 16ths	**18**	**20**	**22**	**24**	
Weight per Dozen, Lbs.	7½	9¼	10	11¾	
Per Dozen	$12.00	14.00	16.00	18.00	

Up to 9/16, One Dozen in a Box; All Others, One-half Dozen in a Box.

AUGER BITS

SOLID CENTRE

Fig. 591

Single twist; made of crucible steel; polished twist and stem; natural finish shank. Twist, 4½ inches; length over all, 8½ to 10 inches, according to size.

NO. 4

Size, Inches, in 16ths	3	4	5	6	7
Weight per Dozen, Lbs.	¾	1	1¼	1⅜	1⅝
Per Dozen	$6.00	6.00	5.00	5.00	5.00
Size, Inches, in 16ths	**8**	**9**	**10**	**11**	**12**
Weight per Dozen, Lbs.	2	2¼	2⅜	2⅞	3
Per Dozen	$5.00	5.00	6.00	7.00	7.00
Size, Inches, in 16ths	**13**	**14**	**15**	**16**	**17**
Weight per Dozen, Lbs.	3½	3⅞	4¼	4¾	5¼
Per Dozen	$8.25	8.25	9.50	9.50	12.00
Size, Inches, in 16ths	**18**	**19**	**20**	**21**	**22**
Weight per Dozen, Lbs.	5½	6	6½	7¼	7½
Per Dozen	$12.00	14.00	14.00	16.00	16.00
Size, Inches, in 16ths			**23**	**24**	**26**
Weight per Dozen, Lbs.			7¾	8	9
Per Dozen			$18.00	18.00	21.00
Size, Inches, in 16ths			**28**	**30**	**32**
Weight per Dozen, Lbs.			11½	12¾	14
Per Dozen			$24.00	27.00	30.00

Up to 16/16, One-half Dozen in a Box; All Others, One-quarter Dozen in a Box

EXPANSIVE BITS

CLARK'S PATTERN

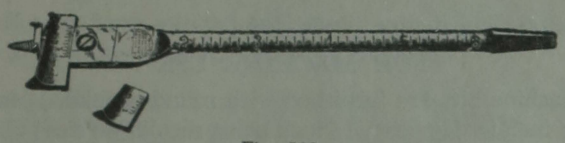


Fig. 592

Drop forged from Jessop steel, each bit carefully tested; shank has graduated scale for determining depth; graduated scale on cutters for regulating diameter of cut; cutters are beveled on one edge to hold them rigid and prevent slipping when set screw is tightened; bit full polished.

	Per Dozen
NO. 50—Small; with Two Cutters; One Cutting from ½ to ⅞; Other, from ⅞ to 1½ Inches; Weight per Dozen, 3 Lbs.	$18.00
NO. 100—Large; with Two Cutters; One from ⅞ to 1¾; Other from 1¾ to 3 Inches; Weight per Dozen, 7½ Lbs.	$20.60

One in a Box

EXTRA CUTTERS FOR EXPANSIVE BITS

NOS.	01	02	03	04
Cuts, Inches	½ to ⅞	⅞ to 1½	⅞ to 1¾	1¾ to 3
Per Dozen	$3.00	3.75	5.25	6.00

Cutters, Nos. 01 and 02 for No. 50.
Cutters, Nos. 03 and 04 for No. 100.

One in a Box

AUGER BITS

FORSTNER

For smooth, round or square boring, scroll and twist work. Made of selected crucible steel, highly polished; guided by its circular rim instead of center, consequently it will bore any arc of a circle in any direction, regardless of grain or knots.

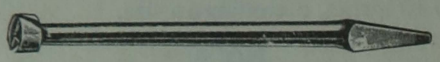


Fig. 593

FOR BRACE

Brace bits have square tapering shanks. Length over all from 6¼ to 8¼ inches, according to size.

Size, Inches	¼	5/16	⅜	7/16	½
Weight per Dozen, Lbs.,	1 5/16	1 5/16	1½	1½	1⅞
Per Dozen	$10.80	10.80	12.00	12.00	12.60

Size, Inches	9/16	⅝	11/16	¾	13/16
Weight per Dozen, Lbs.,	1⅞	1⅞	1⅞	2¼	2¼
Per Dozen	$13.00	13.80	14.40	16.65	16.80

Size, Inches	⅞	15/16	1	1 1/16	1⅛
Weight per Dozen, Lbs.,	2¼	2⅝	3	3	3
Per Dozen	$16.80	20.40	20.40	21.60	21.60

Size, Inches	1 3/16	1¼	1 5/16	1⅜	1 7/16
Weight per Dozen, Lbs.,	3⅜	3⅜	3⅜	3¾	3¾
Per Dozen	$23.40	26.40	26.40	28.20	31.80

Size, Inches	1½	1⅝	1¾	1⅞	2
Weight per Dozen, Lbs.,	4	4	4⅜	4⅜	4⅝
Per Dozen	$36.00	....	....	....	....

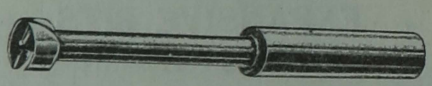


Fig. 594

FOR MACHINE USE

Machine bits are furnished with round shanks, ½-inch to ¾ inch in diameter, ½ inch being regular on sizes up to two inches. Bits larger than two inches have ¾ inch round shanks unless otherwise specified. Bits ¼ to 7/16 inches are 5 inches long over all; 1½ to 2 inches are 6¾ inches long over all.

Size, Inches	¼	5/16	⅜	7/16	½
Weight per Dozen, Lbs.,	1½	1½	1⅞	1⅞	1⅞
Per Dozen	$13.20	13.20	14.40	14.40	15.00

Size, Inches	9/16	⅝	11/16	¾	13/16
Weight per Dozen, Lbs.,	2¼	2¼	2¼	2¼	2⅝
Per Dozen	$16.20	16.20	16.80	18.00	19.20

Size, Inches	⅞	15/16	1	1 1/16	1⅛
Weight per Dozen, Lbs.,	2⅝	2⅝	3	3	3
Per Dozen	$19.20	22.80	22.80	24.00	24.00

Size, Inches	1 3/16	1¼	1 5/16	1⅜	1 7/16
Weight per Dozen, Lbs.,	3	3	3⅜	3⅜	3¾
Per Dozen	$25.80	28.80	28.80	30.60	34.20

Size, Inches	1½	1⅝	1¾	1⅞	2
Weight per Dozen, Lbs.,	3¾	4¼	4½	4½	4⅞
Per Dozen	$38.40	39.60	42.60	45.60	48.60

One in a Box

GIMLET BITS

Fig. 595

Forged from selected crucible steel; oil tempered; straw colored; carefully ground and sharpened. Length over all, about six inches.

NO. 72

Size, Inches, in 32ds	2	3	4
Weight per Dozen, Lbs.	5/8	5/8	¾
Per Dozen	$1.00	1.10	1.10

Size, Inches, in 32ds	5	6	7	8
Weight per Dozen, Lbs.	¾	¾	⅞	⅞
Per Dozen	$1.10	1.10	1.10	1.10

Size, Inches, in 32ds	9	10	11	12
Weight per Dozen, Lbs.	1	1	1¼	1¼
Per Dozen	$1.25	1.25	1.50	1.50

One Dozen in a Box

ELECTRICIANS' AND BELL HANGERS' GIMLETS

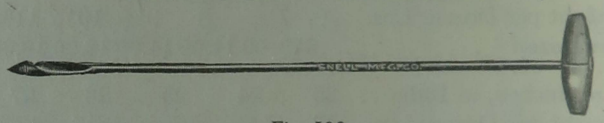


Fig. 596

Made of selected crucible steel, polished; with wood handles. Single cut.

NO. 85

Length, Inches	15	18	24	30	36
Weight per Dozen, Lbs.	¾	1	1⅛	1½	2
Per Dozen	$6.00	7.00	9.001	2.00	15.00

Sizes, 6 to 12/32, Same Price.
One Dozen in a Box

SOLID CAST STEEL CAR BITS

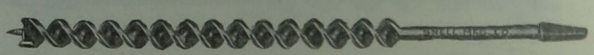


Fig. 597

Solid cast steel; highly polished; tapered shank; natural finish square; has two cutting edges with spurs and side lips; cutters; single thread on screw. 12-inch twist. Length over all, 18 inches.

NO. 206

Size, Inches, in 16ths	4	5	6	7
Weight per Dozen, Lbs.	2	2½	3	3½
Per Dozen	$11.25	11.25	11.25	11.25

Size, Inches, in 16ths	8	9	10	11
Weight per Dozen, Lbs.	4	5	5½	6
Per Dozen	$11.25	12.50	13.75	15.00

Size, Inches, in 16ths	12	13	14	15
Weight per Dozen, Lbs.	6½	7½	8	9½
Per Dozen	$16.25	17.50	19.00	20.50

Size, Inches, in 16ths	16	17	18	20
Weight per Dozen, Lbs.	10	11½	12¾	14
Per Dozen	$22.00	24.00	26.00	30.00

One-half Dozen in a Box

SHIP AUGERS

Adopted to ship, dock, bridge and car building; forged from selected crucible steel; oil tempered; single thread on screw; polished twist and shank; natural finished square. Length of twist about 12 inches; length over all, about 18 inches.

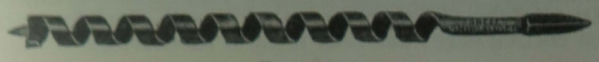


Fig. 598

WITH SCREW

NO. 541

Size, 8ths of an Inch	Weight per Doz., Lbs.	Per Doz.	Size, 8ths of an Inch	Weight per Doz., Lbs.	Per Doz.
2	2½	$11.00	13½	43	$32.00
2½	2¾	11.00	14	46	32.00
3	3	11.00	14½	48	38.00
3½	3½	11.00	15	50	38.00
4	3½	11.00	15½	53	45.00
4½	5	11.00	16	55	45.00
5	6	11.00	16½	57	57.00
5½	8	12.00	17	58	57.00
6	10	12.00	17½	59	72.00
6½	11	13.00	18	60	72.00
7	12	13.00	18½	61	86.00
7½	13	14.50	19	62	86.00
8	14	14.50	19½	63	101.00
8½	19	16.00	20	65	101.00
9	21	16.00	20½	..	115.00
9½	23	18.00	21	..	115.00
10	26	18.00	21½	..	130.00
10½	28	20.00	22	..	130.00
11	30	20.00	22½	..	144.00
11½	33	23.00	23	..	144.00
12	36	23.00	23½	..	158.00
12½	38	27.00	24	..	158.00
13	40	27.00			

Fig. 599

WITHOUT SCREW

NO. 542

Size, 8ths of an Inch	Weight per Doz., Lbs.	Per Doz.	Size, 8ths of an Inch	Weight per Doz., Lbs.	Per Doz.
2	2½	$13.20	13½	43	$38.40
2½	2¾	13.20	14	46	38.40
3	3	13.20	14½	48	45.60
3½	3½	13.20	15	50	45.60
4	3½	13.20	15½	53	54.00
4½	5	13.20	16	55	54.00
5	6	13.20	16½	57	68.40
5½	8	14.40	17	58	68.40
6	10	14.40	17½	59	86.40
6½	11	15.60	18	60	86.40
7	12	15.60	18½	61	103.20
7½	13	17.40	19	62	103.20
8	14	17.40	19½	63	121.20
8½	19	19.20	20	65	121.20
9	21	19.20	20½	..	138.00
9½	23	21.60	21	..	138.00
10	26	21.60	21½	..	156.00
10½	28	24.00	22	..	156.00
11	30	24.00	22½	..	172.80
11½	33	27.60	23	..	172.80
12	36	27.60	23½	..	189.60
12½	38	32.40	24	..	189.60
13	40	32.40			

ANGULAR BORING MACHINES

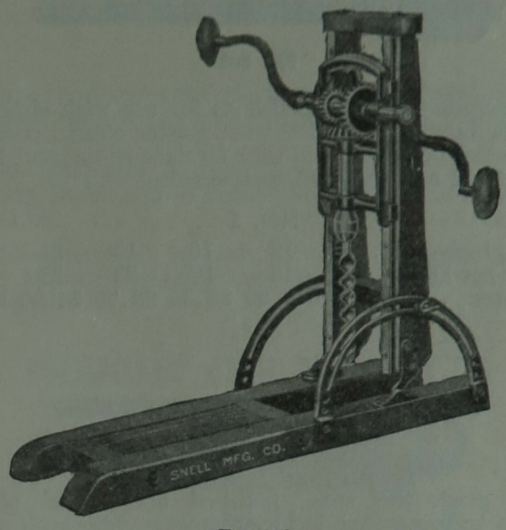


Fig. 600

Japanned malleable iron arch, gears and cranks; steel spindle, chuck and axle; varnished hardwood base; uprights firmly bolted; oval revolving hardwood grips.

	Each
NO. 1—Without Auger; Height, 30 Inches; Width of Base, 10 Inches; Weight Each, 30 Lbs.....	$6.75

One in a Case

BORING MACHINE AUGERS

Fig. 601

NO. 243

Forged from selected tool steel; square lips; polished; twist, 8 inches; shank, ½-inch in diameter.

Size, Inches.....	5/8	3/4	7/8	1	1⅛
Length, Inches.....	10	10	10	10	10
Weight per Dozen, Lbs.	4	5	6	7	8
Per Dozen.....	$10.00	11.00	13.00	15.00	17.00

Size, Inches.....	1¼	1⅜	1½	1¾	2
Length, Inches.....	10	10½	10½	11	11½
Weight per Dozen, Lbs.	9	10	11	13	17
Per Dozen.....	$19.00	21.00	24.00	28.00	32.00

One-quarter Dozen in a Box

POWER MACHINE BITS

Fig. 602

NO. 235

Made of selected crucible steel; highly polished; double twist; when ordering machine bits, state length and diameter of both twist and shank. Can also furnish single twist augers. The different requirements of our customers invariably necessitate our getting these from the factory.

Prices on Application

EXTENSION BIT HOLDERS

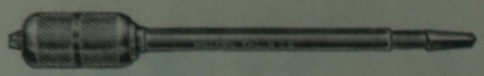


Fig. 603

High grade tool steel; polished; for use with either Bit Brace or breast drill; fitted with master chuck; patented forged steel jaws that will take straight shank and No. 1 Morse taper as well as bitstock shanks.

NO. 1

Length, Inches	12	15	18	21	24
Weight per Dozen, Lbs.	18	20	23	25	27
Per Dozen	$23.00	23.35	23.75	24.60	25.35

Fig. 604

High grade tool steel, polished and nickel plated; chuck a trifle less than 5/8 inch diameter; follows bit of this size and larger into their bores; clamps bitstock shanks rigidly between inner socket and lip of outer sleeve.

NO. 3

Length, Inches	12	15	18	21	24
Weight per Dozen, Lbs.	6	7½	9	10½	12
Per Dozen	$24.75	25.15	25.60	26.50	27.40

BRACE SCREW DRIVER BITS

Fig. 605

A special grade of chrome nickel steel; polished blade and cross ground tip to prevent screw driver from slipping from the slot of screw.

NOS.	1	2	3	4
Width Blade, Inches	7/16	3/8	5/16	1/4
Weight per Dozen, Lbs.	2	2	1¼	1
Per Dozen	$5.50	5.00	4.50	4.00

One Dozen in a Box

SQUARE REAMERS

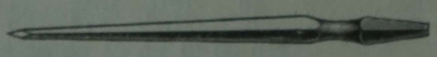


Fig. 606

For soft metals and wood; high grade crucible steel; ground concave; free cutting.

Per Dozen

NO. 40—Cutting edge, 3¾ Inches Long; Tapers, 5/32 Inch to ½ Inch; Weight per Dozen, 2 Lbs. $3.20

OCTAGON REAMERS

Fig. 607

For metal; high grade crucible steel; ground concave; free cutting; oil tempered.

Per Dozen

NO. 50—Cutting edge, 4 Inches Long; Tapers, 5/32 Inch to ½ Inch; Weight per Dozen, 2 Lbs. $4.00

DOUBLE-LIP COUNTERSINKS

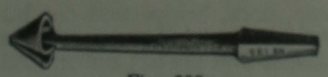


Fig. 608

High grade steel; forged, twisted and tempered; can be sharpened from the inside with file; self centering with keen cutting edge; will clear itself of its shavings.

NO. 195

NOS.	195A	195B
Length Over All, Inches	4½	5¼
Diameter, Inches	5/8	7/8
Each	$0.50	0.55

ROSE COUNTERSINKS

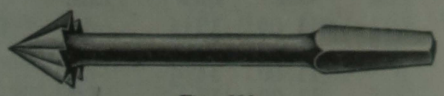


Fig. 609

For soft metal and wood; made of high grade crucible steel, tempered; natural finish bit; deep cutters.

NO. 10

Diameter, Inches	½	5/8	¾	7/8	1
Length Over All, Inches	4	4¼	4½	4¾	5
Weight per Dozen, Lbs.	1½	1¾	2	2¼	2½
Per Dozen	$3.20	3.20	3.50	4.50	5.20
Assorted ½ to ¾ Inch, per Dozen					$3.50

One-half Dozen in a Box

FLAT COUNTERSINKS

Fig. 610

For use on all kinds of metal; made of crucible tool steel; polished end; shank, natural finish.

NO. 15

Diameter, Inches	½	5/8	¾
Length, Inches	4½	5	5½
Weight per Dozen, Lbs.	1¾	2⅛	2½
Per Dozen	$2.00	2.50	3.00
Assorted Sizes, per Dozen			$2.50

DOWEL POINTERS

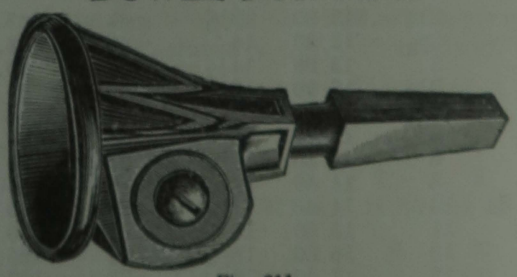


Fig. 611

Points any size dowel under ¾ Inch; Knife made of the best tool steel; japanned body; polished knife and shank; also made with round shank.

Per Dozen

NO. 348—Length Over All, 4 Inches; Weight per Dozen, 1¼ Lbs. $7.00
Extra Blades 3.00

Note:—Round Shanks, 25 per cent Extra.

One-half Dozen in a Box

TOOL HOLDERS

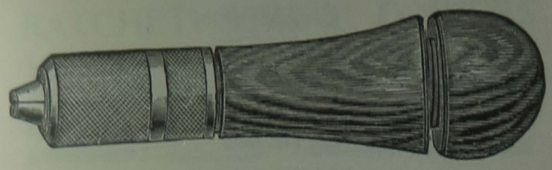


Fig. 612

Tools are contained in hollow handle with screw cap Jaws hold with a viselike grip. Sockets and shell threads are carefully cut to prevent tools from disengaging themselves from jaws; handle is birch stained; tools cut from crucible steel, and polished. Tropical wood handle; nickel plated shell and jaw.

	Per Dozen
NO. 5—Length of Handle, 7½ Inches; Length of tools, 4 Inches; 10 Tools; Weight per Dozen, 11 Lbs.	$35.00

One-half Dozen in a Box

NAIL SETS

Fig. 613

High-grade steel; both ends hardened; knurled centers; tips concaved; oval tops.

NO. 116

NOS.	A	B	C	D
Diameter Tip, Inches	1/16	3/32	1/8	5/32
Length, Inches	4	4	4	4
Weight per Dozen, Lbs.	1	1	1	1
Per Dozen	$1.50	1.50	1.50	1.50

Per Dozen Assorted in Round Wooden Box..... $1.15

Sent without box unless otherwise ordered.

NAIL HOLDERS

Fig. 614

NO. 119

High-grade steel; knurled center; both ends hardened; nail may be placed under the spring in the lower end of holder and held firmly ready to be driven home; after one blow is struck, the holder is withdrawn and nail driven in and sunk with the punch.

	Each
NO. 119—Length Over All, 4 Inches	$0.30

SQUARE HEAD NAIL SETS

Fig. 615

Square head prevents rolling away; hardened on both ends, and will not curl up by hammer blows; blued finish.

	Per Dozen
NO. 50—Diameter, 5/16 Inch; Length 4 Inches; 1/32 to 3/16 Inch Cupped Points; Weight, per Dozen, 3 Lbs.	$1.10
NO. 70—Diameter, 3/8 Inch; Length, 4 Inches; 3/16 to 1/4 Inch Cupped Points; Weight per Dozen, 3½ Lbs.	1.10

FREIGHT CAR NAIL SETS

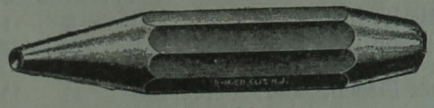


Fig. 616

High-grade octagon tool steel; cup pointed, oil tempered.

	Per Dozen
NO. 25—Length Over All, 4½ Inches; Diameter ¾ Inch; ¼ Inch Diameter Point; Weight per Dozen, 3 Lbs.	$5.80

One-quarter Dozen in a Box

SCREW AND PLUG BITS

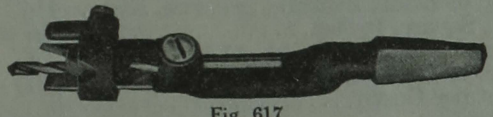


Fig. 617

For finishing fine work, using plugs instead of putty to cover screw heads. Can be gauged so as to give the correct depth for screw and plug, boring both holes in one operation. Knives are made of the very best tool steel. With screw and plug bit plug cutter can be furnished to match.

Diameter, Inches	1/2	9/16	5/8
Diameter Drills, Inches	1/8	9/64	5/32
Weight Each Set, Ounces	7½	9	10
Per Set	$4.50	4.80	5.00

	Per Dozen
Knives Only, Bent	$5.00
Knives Only, Straight	4.00

One Set in a Box

PLUG CUTTERS

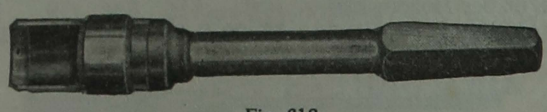


Fig. 618

For cutting plugs to cover head of screws on finely finished work. Knives are interchangeable; in case one is broken, it can be replaced at small cost. Made of very best tool steel, carefully hardened, tempered and tested.

Diameter, Inches	3/8	7/16	1/2
Weight per Dozen, Lbs.	1½	1¾	1¾
Per Dozen	$6.50	7.00	7.00

Diameter, Inches	9/16	5/8	3/4
Weight per Dozen, Lbs.	2⅜	2¾	3½
Per Dozen	$7.50	8.00	10.00

SCREW DRIVERS

PERFECT HANDLE

The blade, bolster, handle-flat and hammer head are drop forged from one piece of steel; wooden handles are pocketed in each side of the drop forging in such a manner that it is almost impossible to separate them; the oval shape handle fits the hand perfectly.

Fig. 619

NO. 609

Length Blade, Inches	4	5	6
Length Over All, Inches	7¾	8¾	9¾
Diameter of Blade, Inches	¼	¼	5/16
Weight per Dozen, Lbs.	4	4½	4⅝
Per Dozen	**$4.25**	**5.00**	**6.00**

Length Blade, Inches	7	8	10	12
Length Over All, Inches	11⅝	12⅝	16⅝	20
Diameter of Blade, Inches	5/16	⅜	⅜	⅜
Weight per Dozen, Lbs.	6¾	11	11¾	13
Per Dozen	**$7.00**	**8.00**	**10.00**	**12.00**

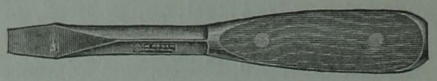


Fig. 620

MACHINISTS

Has square shank on which wrench may be applied to tighten or loosen cap screws, set screws, etc.

NOS.	9½	10½
Length Over All, Inches	9½	10½
Length of Blade, Inches	4½	5
Size of Square, Inches	7/16	9/16
Width of Point, Inches	½	¾
Thickness of Point, Inches	5/64	5/64
Weight per Dozen	8	12
Per Dozen	**$12.00**	**13.00**

CHAMPION

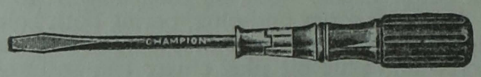


Fig. 621

Blade forged from refined steel, tempered and shrunk into a solid malleable bolster which rests in heavy handle ferrules; tang, which forms part of bolster, enters and nearly passes through the handle; red enamelled maple handles.

REGULAR

Length Blade, Inches	2½	3	4	5	6
Length Over All, Inches	7	8⅛	9¾	11¼	12½
Weight per Dozen, Lbs.	1½	1¾	2¾	4	4½
Per Dozen	**$3.00**	**3.50**	**4.25**	**5.00**	**6.00**

Length Blade, Inches	7	8	9	10	12
Length Over All, Inches	14⅛	14¾	16⅛	17⅝	19⅝
Weight per Dozen, Lbs.	6	6½	8¾	9	10¼
Per Dozen	**$7.00**	**8.00**	**9.00**	**10.00**	**12.00**

Fig. 622

CABINET

Length Blade, Inches	2½	3½	4½	5½
Length Over All, Inches	6¾	7½	9⅛	9½
Weight per Dozen, Lbs.	1¾	1¾	1⅞	2
Per Dozen	**$3.00**	**3.50**	**4.50**	**5.50**

Length Blade, Inches	6½	8½	10½	12½
Length Over All, Inches	10¾	12⅜	14¾	16⅜
Weight per Dozen, Lbs.	2⅛	2 5/16	2⅝	3
Per Dozen	**$6.50**	**8.00**	**9.50**	**11.00**

All Above, One-half Dozen in a Box

SCREW DRIVERS

CHAMPION

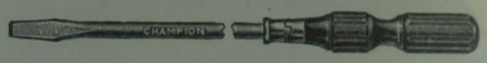


Fig. 623

MACHINISTS

Double Grip for holding with both hands.

Length Blade, Inches	12	15	18	24	30
Length Over All, Inches	25	25⅛	29	35	40¾
Weight per Dozen, Lbs.	15⅞	19	23	27¼	31
Per Dozen	**$14.00**	**16.00**	**18.00**	**24.00**	**30.00**

YANKEE

Fig. 624

PLAIN RATCHET

Adjustment for right or left hand drive is made by pushing shifter to left or right hand end of slot; when placed midway the blade is held rigid as in ordinary screwdriver. Polished rosewood handle. Blade forged from tool steel, tempered and polished; nickel plated ratchet case;

NO. 10

Length Blade, Inches	2	3	4	5
Length Over All, Inches	4⅞	7¼	8¼	9¼
Weight per Dozen, Lbs.	1¼	3¼	3⅜	3½
Per Dozen	**$10.50**	**12.90**	**13.80**	**15.20**

Length Blade, Inches	6	8	10	12
Length Over All, Inches	10¾	13	15¼	17¼
Weight per Dozen, Lbs.	5¼	6	7⅜	8⅛
Per Dozen	**$17.10**	**19.30**	**23.20**	**25.50**

One in a Box

Fig. 625

SPIRAL RATCHET

Adjustable for right and left hand drive and may be operated as an ordinary ratchet in either the closed or extended position. Tempered ground and polished steel blades are held in a spring sleeve chuck; polished rosewood handle with metal parts nickel plated and buffed; ratchet mechanism is practically frictionless; furnished with three blades of different widths and thickness.

Per Dozen

NO. 30—Reversible Spiral; Length of Handle, 4 Inches; Length Over All, Closed with Blade Attached, 13½ Inches; Diameter of Chuck, 5/8 Inch; Weight per Dozen, 13 Lbs. $48.20

NO. 31—Heavy Reversible Spiral; Length of Handle, 4½ Inches; Length Over All Closed, with Blade Attached, 17½ Inches; Diameter of Chuck, ¾ Inch; Weight per Dozen, 18 Lbs. 64.70

With Spring Return

Similar in appearance to Nos. 30 and 31, except it has a spring in the handle, which causes the handle to come back for the next stroke in driving screws in or out.

NO. 130—Reversible Spiral; Length of Handle, 4 Inches; Length Over All Closed, with Blade Attached, 15 Inches; Diameter of Chuck, 5/8 Inch; Weight per Dozen, about 15 Lbs. $55.00

NO. 131—Heavy Reversible Spiral; Length of Handle, 4½ Inches; Length Over All Closed, with Blade Attached, 19⅜ Inches; Diameter Chuck, ¾ Inch; Weight per Dozen, 24 Lbs. 74.30

One in a Box

ATTACHMENTS FOR SPIRAL RATCHET SCREW DRIVERS

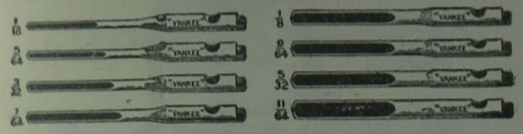


Fig. 626

Fig. 627

CHUCKS WITH DRILL POINTS

Converts a spiral ratchet screw driver into an automatic drill. Chuck made of crucible steel, polished; Drill Points can be used on hard or soft wood.

FOR NOS.	30 and 130	31 and 131
Size Drill Points, Inches	1/16 to 11/64	1/16 to 11/64
Chuck with Points, per Set	$1.28	1.28

COUNTERSINKS

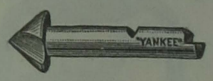


Fig. 628

Snail type; for hardwood. Crucible steel; polished.

FOR NOS.	30 and 130	31 and 131
Weight per Dozen, Lbs.	5/16	9/16
Per Dozen	$4.20	4.20

Note.—When ordering be sure to state for what number screw driver it is to be used.

EXTRA SCREW DRIVER BITS

FOR NOS.	30 and 130	31 and 131
Size of Shanks, Inches	9/32	5/16
Per Dozen	$3.36	3.36
Per Set of Three	$0.84	.84

AUTOMATIC DRILLS

YANKEE

Fig. 629

Brass plunger and tube; knurled steel handle, nickel plated, has 8 drill points 1/16 to 11/64 Inch; steel chuck; magazine is opened by loosening a nut at its lower end and moving upward the interior of handle; exposing the points; during the return movement of handle the Drill Point revolves backward to clear chips, etc.

Per Dozen

NO. 41—Entire length of tool inclusive of Drill Point, 11 3/8 inches; weight per dozen, 7 7/8 Lbs. $41.80

Fig. 630

WITH ADJUSTABLE TENSION

Brass plunger and tube, nickel plated, steel handle, has eight Drill Points, 1/16 to 11/64 inch; steel chuck. Magazine made of steel; when tool is held to insert drill in chuck the open end of magazine is up, same as chuck, preventing tools from falling out.

Per Dozen

NO. 44—Entire length of tool, Drill Point included, 11 1/4 inches; weight per dozen, 9 lbs. $50.30

BEARING SCRAPERS

Fig. 631

THREE SQUARE

Tempered tool steel, concave blade; maple handle, polished edges; steel ferrule.

Per Dozen

NO. 30—Blade, 3 1/4 inches long; weight per dozen, 3 lbs. $5.50

NO. 70

Three square, high-grade, tempered tool steel, ground concave; natural finish handle.

Length Blade, Inches	6	8	9
Cutting Edge, Inches	2 5/8	3 1/4	3 7/8
Weight per Dozen, Lbs.	4	5 1/2	8
Per Dozen	$6.00	7.50	8.50

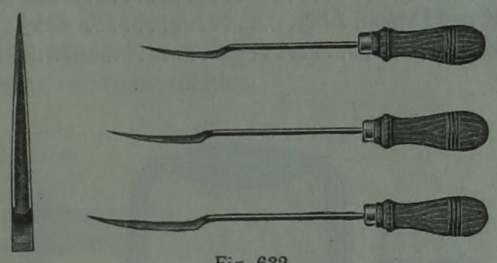


Fig. 632

Forged from high-grade tool steel, hardened and tempered. Cutting and scraping edges are hollow ground, polished and honed.

NO. 10

Length Blade, Inches	7	8	9
Straight Cutting Edge, Inches	2 3/4	3 1/2	3 3/4
Weight per Dozen, Lbs.	3	3 1/2	4 1/2
Per Dozen	$8.00	9.00	10.00

All Above, One-half Dozen in a Box

CARBON SCRAPER SETS

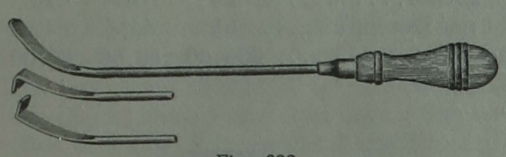


Fig. 633

Polished shanks, blued blades; round, red finished handles; scraping ends sharpened.

Per Set

NO. 35—Length over all, 13 inches; weight per set of three, 1 lb. $0.70

One Set in a Box

COTTER PIN EXTRACTORS

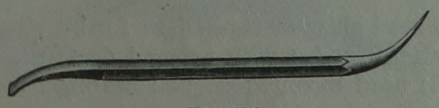


Fig. 634

Carbon finish, blued ends; round end to extract, flat end to spread or clinch Cotter Pins.

Per Dozen

NO. 16—Length over all, 7 1/4 inches; weight per dozen, 2 1/2 lbs. $3.00

One Dozen in a Box

BIT BRACES

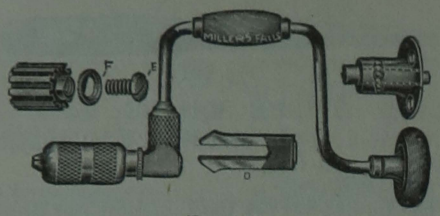


Fig. 635

MASTER

Polished and nickeled steel; cocobolo wood, ball bearing grip and head; concealed ratchet; forged steel jaws, holding securely round shanks from ⅛ to ½ inch in diameter; No. 1 Morse Taper and all sizes of bit stock and expansion bit shanks.

NOS.	831	832
Sweep, Inches	12	10
Weight per Dozen, Lbs.	43½	40½
Per Dozen	**$52.20**	**49.80**

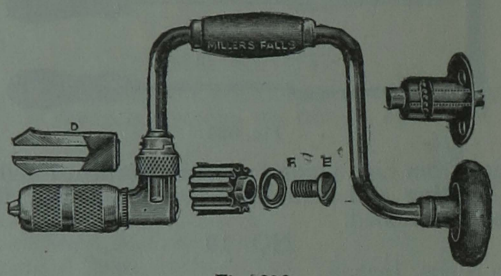


Fig. 636

HOLDALL

Similar to the Master Brace but has exposed ratchet dogs and the grip is not ball-bearing.

NOS.	730	731	732	733
Sweep, Inches	14	12	10	8
Weight per Dozen, Lbs.	51	44¼	42	37½
Per Dozen	**$58.00**	**56.00**	**54.00**	**52.50**

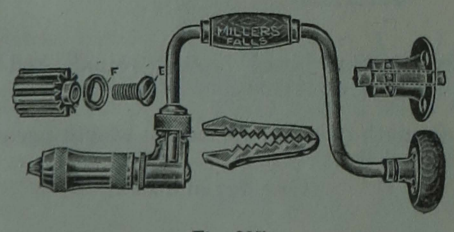


Fig. 637

BARBER-RATCHET

Forged steel alligator chuck jaws for bit stock shanks; boxed pattern ratchet with exposed dogs; cocobolo grip and head; head mounted on ball bearings; metal parts polished and nickel plated.

NOS.	30	31	32	33	34
Sweep, Inches	14	12	10	8	6
Weight per Dozen, Lbs.	45	39	36¾	32¾	30
Per Dozen	**$53.00**	**51.00**	**49.00**	**47.50**	**47.50**

All Above, One-sixth Dozen in a Box

BIT BRACES

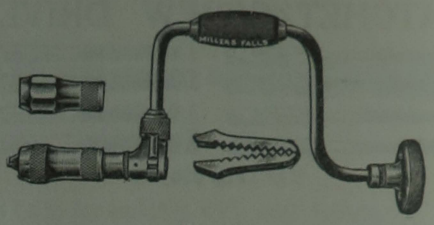


Fig. 638

BARBER—RATCHET

Polished nickel plated steel; stained hardwood grip and ball bearing head; open ratchet, forged steel jaws; metal rings inserted in sweep handle.

NOS.	321	322	323
Sweep, Inches	12	10	8
Weight per Dozen, Lbs.	34	31½	27½
Per Dozen	**$42.00**	**40.50**	**39.50**

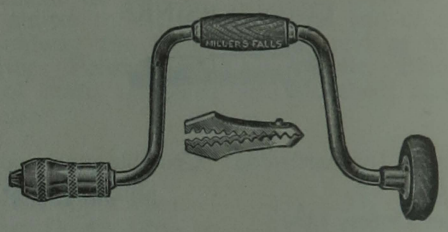


Fig. 639

BARBER-PLAIN

Polished nickel plated steel; stained hardwood handle and head; metal rings inserted in sweep handle; forged steel alligator jaws.

NOS.	220	221	222	223
Sweep, Inches	14	12	10	8
Weight per Dozen, Lbs.	32	27½	25½	20
Per Dozen	**$28.00**	**26.50**	**25.00**	**24.00**

All Above, One-half Dozen in a Box

DRILL BRACES

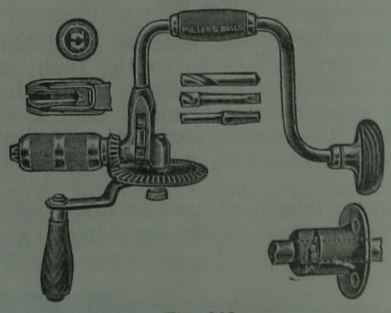


Fig. 640

Polished nickel plated steel; cocobolo head and handle; ball bearing head; drilling attachment removed or affixed in a moment; master chuck for holding square and taper shanks, also round shanks ⅛ to ½ inch.

Per Dozen

NO. 182—10 inch sweep; gear ratio 3 to 1; 3¾ inch cast iron gear wheel; weight per dozen, 57 lbs. $87.00

One in a Box

HAND DRILLS

Fig. 641

Japanned malleable iron frame; nickel plated steel chuck with three-piece jaw; nickel plated steel handle crank; ball thrust bearing; cut gears with adjustable equalizing bearing; large gears painted red; pinion of steel; cocobolo knob and handle; hollow screw top handle contains eight drill points from 1/16 to 11/64 inch; chuck will hold round shank drills from 0 to 3/16 inch diameter.

Per Dozen

NO. 1—Length Over All, 12½ Inches; Weight per Dozen, 20 Lbs. $38.00

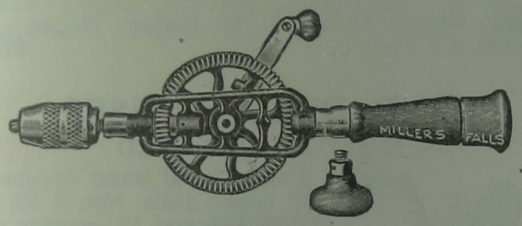


Fig. 642

Japanned malleable iron gear frame; nickel plated steel chuck; with three-piece jaw; cocobolo handles; nickel plated steel crank; hollow end handle with screw cap containing eight drills; chuck will hold drills from 0 to 3/8 inch in diameter; large gear painted red.

Per Dozen

NO. 2—Length Over All, 14½ Inches; Weight per Dozen, 29 Lbs. $56.00

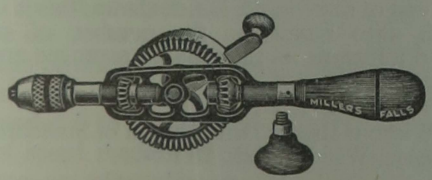


Fig. 643

Japanned malleable gear frame; nickel plated steel chuck with three-piece jaw; nickel plated steel handle crank; cocobolo end handle with screw cap containing eight wood boring points ranging in size from 1/16 to 11/64 inch in diameter; removable side grip handle; cut gears; large gear with wide rim to be grasped between thumb and fingers when delicate work is being done and with idler gear to equalize bearings; pinions of steel; ball thrust bearing; chuck holds drills from 0 to 3/16 inch in diameter.

Per Dozen

NO. 5—Length Over All, 12½ Inches; Weight per Dozen, 22 Lbs. $41.50

All Above, One in a Box

CORNER BIT BRACES

WITH MASTER CHUCKS

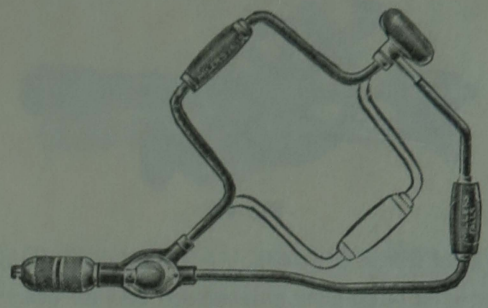


Fig. 644

Polished and nickel plated except japanned hub casting; ball bearing head and adjustable, free acting sweep and steadying handles, made of cocobolo wood; ball thrust bearing at base of chuck; chuck is turned by enclosed case hardened gears which are accessible. Master chucks hold securely, bitstock, straight shank 1/8 to ½ inch and Morse No. 1 taper shanks; jaws have milled teeth which adjust themselves to fit these shanks.

NOS.	502	503
Sweep, Inches	10	8
Length, Inches	17½	17½
Weight per Dozen, Lbs.	57	55
Per Dozen	$81.00	76.00

One-sixth Dozen in a Box

UNIVERSAL ANGULAR BITSTOCKS

Fig. 645

Japanned malleable iron frame; with ball and socket joint; nickel plated steel master chuck for holding square, taper shank and round shanks 1/8 to ½ inches; polished steel square shank; blued forged steel jaws. Can be used in connection with any bit brace and changed to any position from a straight line to an angle of 125 degrees; useful for working into corners and obstructed places.

Per Dozen

NO. 108—Length when at 180°, 12½ Inches; Weight per Dozen, 26 Lbs. $37.00

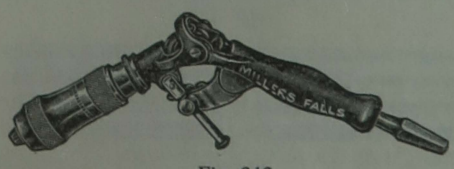


Fig. 646

Same as No. 108, but fitted with Barber chuck, having alligator jaws intended especially for bitstock shanks.

Per Dozen

NO. 109—Weight per Dozen, 26 Lbs. $36.00

One in a Box

HAND DRILLS

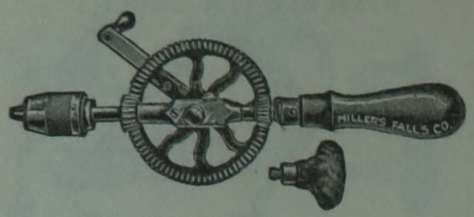


Fig. 647

Solid steel frame with 4-inch gear and steel pinions; all gears are cut; large gear painted red and all other metal parts polished; solid end handle and detachable side handle of stained hardwood. Self opening jaws; star pattern chuck with capacity up to ¼ inch; no drill points included.

Per Dozen

NO. 7—Length, 12½ Inches; Weight per Dozen, 23 Lbs. $39.00

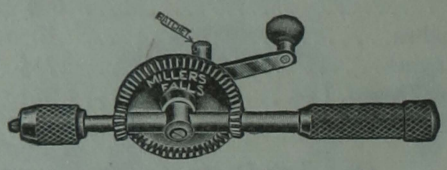


Fig. 648

RATCHET

All enameled and is hollow to hold twist drills up to the capacity of chuck. Hollow steel handle with a screw cap holds drills up to the capacity of the chuck; black enameled; large gear, black with red stripe; other parts nickeled; all gears are cut; small working gear and idler gear are steel; ratchet is controlled by a boss on crank handle; three-jaw springless chuck holds round shank drills up to 3/16 inch. Drills not included with this tool.

Per Dozen

NO. 353—Length, 11 Inches; Weight per Dozen, 21 Lbs. $51.00

All Above, One in a Box

EXTRA POINTS FOR HAND DRILLS

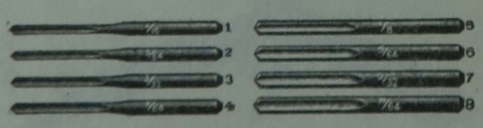


Fig. 649

High-grade crucible steel; highly finished; for use on wood and soft metals only.

Per Set of 8 Points $0.35
Per Dozen ..... .50

One Set or One Dozen to a Box

HAND DRILLS

YANKEE—DOUBLE SPEED

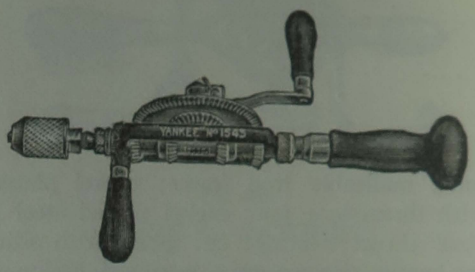


Fig. 650

WITH RIGHT AND LEFT HAND AND CONTINUOUS RATCHET MOVEMENT.

All the various ratchet movements are controlled by a shifter in the cylinder between the small gears. Malleable iron frame; dead black finish; three-jaw chuck holds round shank drill up to ⅜ inch; polished hardwood handle is hollow and can be used as a magazine for drills; large gear, 4½ inches in diameter; small gear, 2½ inches in diameter.

Each

NO. 545—Length Over All, 16 Inches; Weight Each, 4¼ Lbs. $12.78

HAND DRILL PRESSES

SENSITIVE HAND FEED

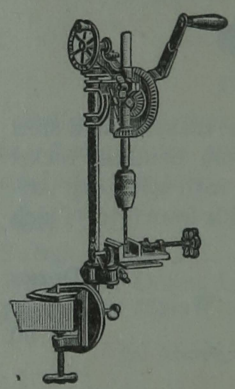


Fig. 651

Standard and frame designed to hold breast drills, Nos. 5, 10, 10A, 11, 12, 12A and 18, convert them into drill presses or bench drills; the bench clamp, vise rest and frame are all clamped to the main standard and can be moved up and down, or swung to the right or left, and, by means of the thumb screw provided, clamped or secured at any desired point; the table can be reversed to present either a vise or table as the operator may require, and is hung on a pin of center to admit of a variety of positions; the operator may, if desirable, work below the bench by dropping the frame and fixtures down on the standard and securing the upper end of same in the bench clamp; this is very convenient in auto repairing; the number of positions, heights and adjustments that can be arranged are almost unlimited.

Each

NO. 20—Without Breast Drill; Height of Standard, 24 Inches; Weight Each, 28 Lbs. $11.00

Similar to No. 20, but with drilling attachments permanently affixed, making it a complete tool in itself. Speed changeable from even to 3 to 1; extensible crank with radius from 5 to 6½ inches; star chuck takes round shanks up to ½ inch; chuck spindle and crank nickel plated; large gear block.

Each

NO. 21—Complete; Weight Each, 30 Lbs. $15.00

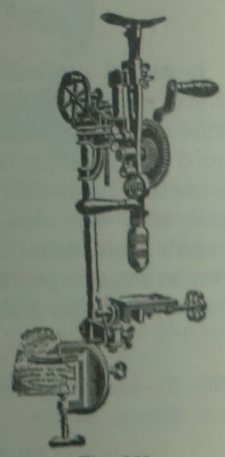


Fig. 652

BREAST DRILLS

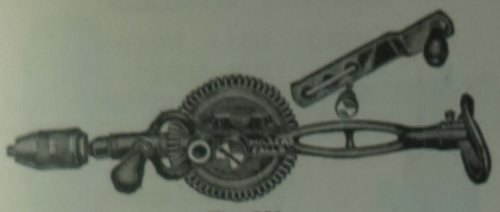


Fig. 653

Malleable iron frame painted black; large gear and breast plate painted green; stained hardwood handles; chuck and crank nickeled; star pattern chuck with three jaws; made especially for holding round shanks from 0 to ½ inch; jaws are operated by springs that are protected from injury and will not get out of order; extensible crank with radius from 4 to 6 inches; pinion of steel; ball thrust bearing; changeable speed from even to 3 to 1. Master chuck holding round shanks from ⅛ to ½ inch in diameter; extensible crank with radius from 4 to 6 inches.

Per Dozen

NO. 118—Length Over All, 17½ Inches; Weight per Dozen, 81 Lbs. $83.00

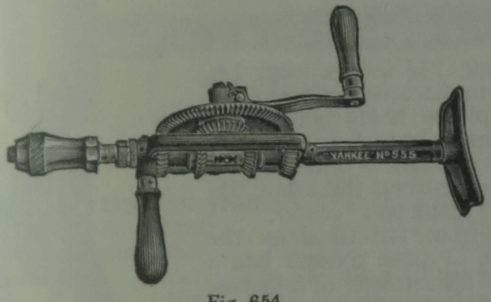


Fig. 654

DOUBLE SPEED

With Right and Left Hand and Continuous Ratchet Movement

Equipped with simple mechanism for changing from plain drill to left or right hand or double ratchet. Convenient for use in close corners where only part revolution of crank can be obtained. Frame of malleable iron, dead black finish; cast iron gears with cut teeth; large gear 5½ inches, speeded 3 to 1; small gear 1⅞ inches, even speed. Change of speed made by means of lever at hub crank. Ball bearings are adjustable; two-jaw chuck, nickel plated; with malleable iron sleeve, for round or square shank drills up to ½ inch.

Each

NO. 555—Length Over All, 18 Inches; Length Crank, 5½ inches; Weight Each, 7 Lbs. $15.40

No. 1555

Similar to No. 555, but with three-jaw chuck, which holds round shanks only up to ½ inch; 2¾ inches long, 1⅝ inches diameter.

Each

NO. 1555—Length, 17 Inches; Weight Each, 6¾ Lbs. $15.40

Note.—D Handles to use in place of breast plate for overhead work. Can be supplied as an extra part.

All Above, One in a Box

BREAST DRILLS

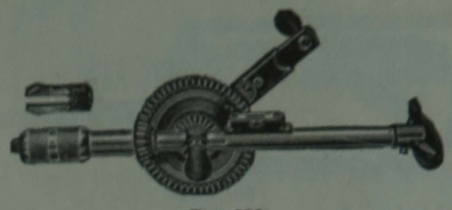


Fig. 655

Solid steel frame; large gear and breast plate are painted red; other metal parts are nickel plated; hardwood handles, stained; the breast plate is adjustable or removable; extensible crank with radius from 5½ to 7 inches, fitted with level attachment and master chuck holding round shanks from ⅛ to ½ inch, bitstock and No. 1 Morse taper shank; all cut gears; speed changeable from even to 3 to 1.

Per Dozen

NO. 10—Length, 17 Inches; Weight per Dozen, 78 Lbs. $83.00

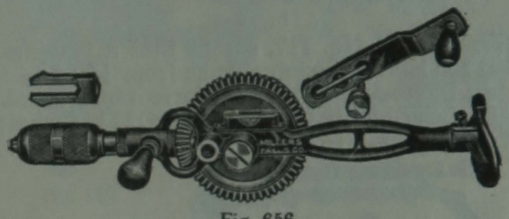


Fig. 656

IMPROVED

Malleable iron frame painted black; large gear and breast plate painted green; hardwood handles; stained; patented level attachment; breast plate, adjustable to different positions and removable; thoroughly equipped with ball bearings; cut gears; large gear with idler roll to equalize bearings; pinion steel; extensible crank with radius from 4 to 6 inches; adding to the power of the tool; changeable speed from even to 3 to 1; master chuck holding round shanks from ⅛ to ½ inch in diameter.

Per Dozen

NO. 12—Length Over All, 17½ Inches; Weight per Dozen, 179 Lbs. $73.00

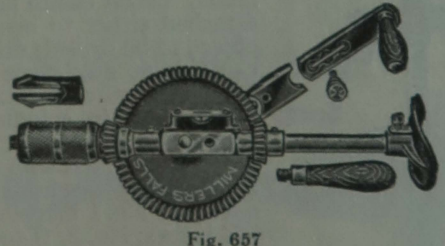


Fig. 657

Solid steel main stock; large gear and under side of breast drill plate painted red; other metal parts polished and nickeled; rare tropical wood handles; cut gears; large gear, 6 inches in diameter, giving speed of 4½ to 1; idler gear to equalize bearings; pinions of steel; breast plate adjustable to different positions and removable; extensible crank with radius of 5½ to 7 inches, adding to power of the tool; ball thrust bearing, master chuck; holding and centering round shanks from ⅛ to ½ inch diameter, and all sizes of bitstocks.

Per Dozen

NO. 13—Length Over All, 15 Inches; Weight per Dozen, 70 Lbs. $86.00

All Above, One in a Box

CHAIN DRILLS

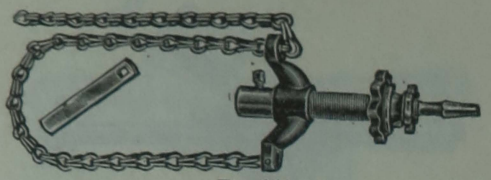


Fig. 658

Malleable iron frame, black japanned; steel shank and socket, nickel plated and polished; ½ inch hole in socket; steel set screw; 48 inch bright steel heavy American cut chain; can be fed automatically or by hand; automatic feed is self-regulating according to the size of drill; feeding slowly or rapidly as desired; length of main spindle 8½ inches. Each

NO. 717—Without Chuck; Weight Each, 3½ Lbs. $3.60

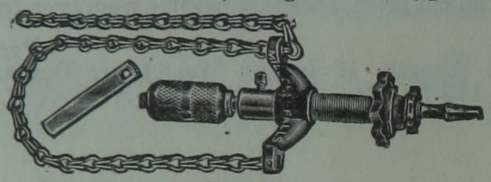


Fig. 659

Similar to drill No. 717, except that a two-jaw chuck is added for holding round shanks from ⅛ to ½ inch in diameter; bitstock and No. 1 Morse taper shank drills

NO. 718—Length With Chuck Inserted, 11½ Inches; Each
Weight Each, 4½ Lbs. $5.30

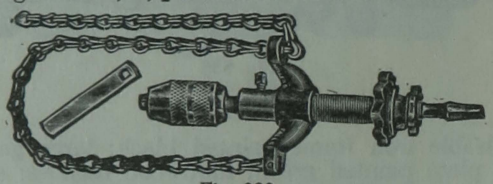


Fig. 660

Similar to No. 718 except that three-jaw chuck is provided for holding round shanks from 0 to ½ inch in diameter; jaws are operated by springs that are protected from injury and will not get out of order.

NO. 719—Length With Chuck Inserted, 11¾ Inches; Each
Weight Each, 4½ Lbs. $6.10

ANGULAR AND RATCHET DRILLING MACHINES

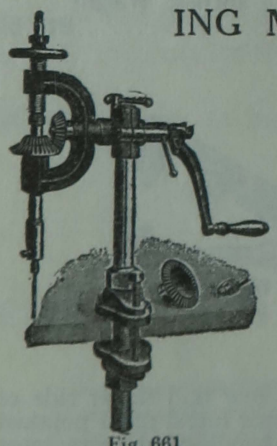


Fig. 661

Steel standard, shafts and spindles; malleable iron frame, crank, bench clamp and gears; attached either to bench or to object to be drilled; drills vertically or at any angle desired; hand feed; ratchet attachment; socket hole in spindle for ½ inch round shank; but bored to order for ⅝ inch without extra charge; extensible from standard outward; No. 1 machine. 4½ to 5¾ inches; No. 2, 6 to 8 inches and No. 3, 7 to 10½ inches; chuck to hold round shanks from 0 to ½ inch in diameter included in price. Each

NO. 1—Ball Bearing; Geared Up, Ratio 2 to 1; Drills Holes up to ⅝ Inch; Height Standard, 25½ Inches; Weight Each, 50 Lbs. $40.00

NO. 2—Plain Hardened Anti-friction Bearing; 2 Sets of Gears either Up 1¾ to 1 or Back 1 to 1¾; Drills Holes Up to 1 Inch; Height Standard, 25½ Inches; Weight Each, 86 Lbs. 47.00

NO. 3—Plain Hardened Anti-friction Bearing; Geared Back, Ratio 1 to 2; Drills Holes Up to 1½ Inches; Height Standard, 28½ Inches; Weight Each, 35 Lbs. 56.00

All Above, One in a Box

BENCH DRILLS

YANKEE—BALL BEARING

ONE SPEED

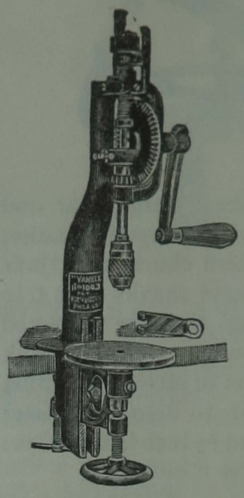


Fig. 662

Cast iron frames, dead black finish; gears and pinions cut from solid steel; ball bearings at lower end; feed screw of steel with square threads; three-jaw chucks made of tool steel; all steel parts subject to wear are hardened; chuck, 1¾ inches long, 1 inch diameter; holds Drills up to ¼ inch diameter; chuck revolves 3½ times to one turn of the handle; spindle, ⅜ inch in diameter; small lever on arm locks spindle to open and close chuck; fitted with bracket to throw off ratchet feet at extreme up and down movement; table is adjustable up to 2¾ inches; and has independent movement of 1¼ inch by means of a 3-inch hand wheel; the table is 4¾ inches in diameter, center, 2½ inches from face of slide; large gear wheel, 3⅝ inches diameter; height over all, 18¾ inches.

NO. 1003—For Drill Up to ¼ Inch Inclusive; Each
Weight Each, 20 Lbs. $20.70

TWO SPEED

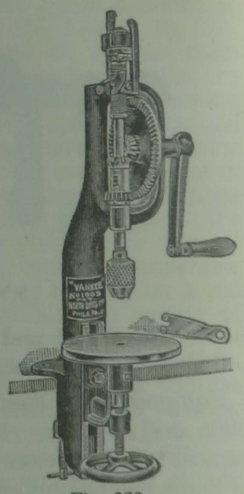


Fig. 663

Chuck, 2¾ inches long, 1 9/16 inches in diameter, polished and nickel plated; holds round shank drills up to ½ inch in diameter inclusive; crank is 6 inches long between centers; the table, 6¾ inches diameter; center, 3½ inches from fall of slide; the bracket at base column has a vertical adjustment of 5 inches; the slide being 9¼ inches and brackets, 4¼ inches long; made with two speeds and quickly changed by simply moving the shifter on spindle to top notch for slow, or to bottom notch for fast speed; shifter placed in center notch locks spindle, to open or close chuck; on the fast speed (geared 64 to 18) one revolution of crank gives 3½ to spindle and on slow speed (geared 14 to 14) one revolution of crank gives one to spindle. Each

NO. 1005—For Drills Up to ½ Inch, Inclusive;
Weight Each, 57 Lbs. $34.50

DRILL VISES

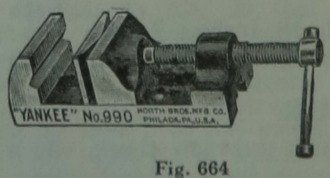


Fig. 664

YANKEE

Designed for Yankee bench drills or separately attached to bench. Body and sliding jaw cast iron, the sliding jaw having a T-shaped block screwed to underside. A removable case-hardened steel swivel jaw is provided to hold taper work. The stem on jaw holds it in position; two counter-sunk holes provided in base for screwing vise to bench if desired. Each

NO. 990—Opening of Jaws Without Swivel, 3 Inches; Opening of Jaws With Swivel, 2⅝ Inches; Depth of Jaws, 1⅜ Inches; Weight Each, 3¾ Lbs. $4.40

One in a Box

HIDE FACE HAMMERS

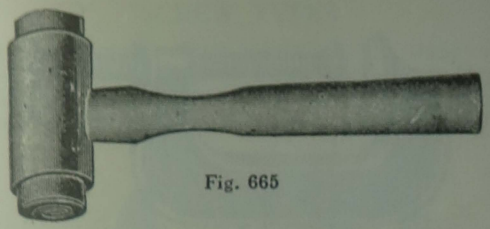


Fig. 665

Malleable iron head with inserted rawhide faces. The hide faces can be easily renewed at slight cost when worn.

NOS.	0	1	2
Length Heads Over All, Inches	3	4	4 3/8
Diameter Heads, Inches	7/8	1 1/4	1 1/2
Weight per Dozen, Lbs.	6	12 3/4	16 3/4
Per Dozen	$16.20	18.96	24.12
Extra Heads, per Dozen Pairs	$5.04	5.40	6.48
NOS.	3	4	5
Length Heads Over All, Inches	4 5/8	5 1/2	5 1/2
Diameter Heads, Inches	1 3/4	2	2 3/4
Weight per Dozen, Lbs.	27	48	69
Per Dozen	$28.80	41.76	59.88
Extra Heads, per Dozen Pairs	$8.28	11.52	16.32

RAWHIDE MALLETS

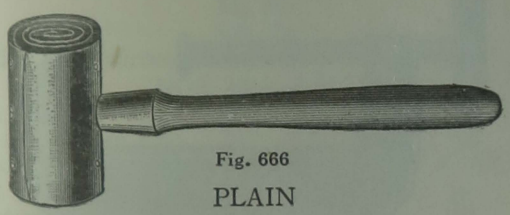


Fig. 666

PLAIN

Light mallets, heads made entirely of hide.

NOS.	0	1	2	3
Length Heads Over All, Inches	2 3/8	3 1/8	3 1/4	3 3/8
Diameter Heads, Inches	1	1 1/4	1 1/2	1 3/4
Weight per Dozen, Lbs.	1 2/3	3	4 1/2	6
Per Dozen	$7.20	8.64	10.08	11.52
NOS.	4	5	6	
Length Heads Over All, Inches	3 1/2	4 1/4	4 3/4	
Diameter Heads, Inches	2	2 3/4	2 3/4	
Weight per Dozen, Lbs.	7 1/2	16 1/2	18	
Per Dozen	$14.64	32.40	36.60	

LOADED

Same size as the ordinary rawhide mallet, but having a soft metal core. The weight is doubled without increasing the size of the head.

NOS.	7	8	9	10	11
Length Head Over All, Inches	3	3 1/8	3 3/8	3 1/2	4 1/4
Diameter Head, Inches	1 1/4	1 1/2	1 3/4	2	2 3/4
Weight per Dozen, Lbs.	6	9	13 1/2	15	33
Per Dozen	$10.20	11.40	13.20	16.44	36.48

RAWHIDE MAWLS

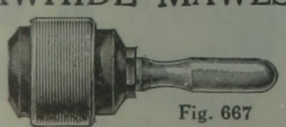


Fig. 667

Commonly used for hand cutting dies. Iron frame with rawhide filling; filling is easily replaced when worn. Wooden handles.

NOS.	1	2	3
Length Over All, Inches	10	11	11 3/4
Weight Each, Lbs.	3	4	6
Each	$2.00	2.30	2.75
Refilling, Each	$1.40	1.80	2.20
NOS.	4	5	6
Length Over All, Inches	13	13	14 1/4
Weight Each, Lbs.	8	10	12
Each	$3.00	3.30	3.75
Refilling, Each	$2.60	2.90	3.20

HICKORY MALLETS

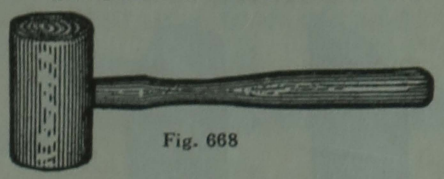


Fig. 668

Round nicely finished hickory heads and handles. No. 4 is regular Tinner's Mallet.

NOS.	1	2	3	4
Length of Head, Inches	5	5 1/2	6	5 1/2
Diameter of Head, Inches	3	3 1/2	4	2 1/4 or 2 1/2
Weight per Dozen, Lbs.	15 1/2	22	28 1/2	10 1/2
Per Dozen	$1.50	2.00	2.50	1.00

BENCH STOPS

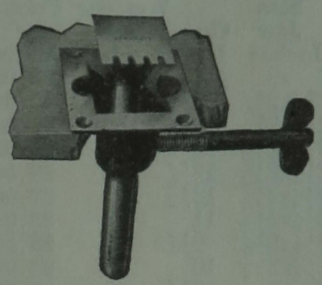


Fig. 669

Cast iron, japanned and polished; shank is easily adjusted to any angle and can be turned completely around so as not to mar the work; adjusting shank is held by a thumb screw, countersunk in front of bench. Shank can be raised any height to 4 inches.

Per Dozen

NO. 401—Weight per Dozen, 14 Lbs. $18.00

One-half Dozen in a Box

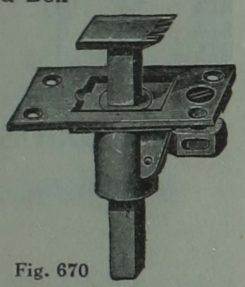


Fig. 670

For holding wood in position on a work bench when planing or otherwise working it. Sunk into the bench so it is flush when not in use, and by means of a set screw the toothed stop can be raised to any desired height. Made of semi and wrought steel, face polished.

Per Dozen

NO. 1—Weight per Dozen, 10 1/2 Lbs. $18.00

One-half Dozen in a Box

IRON BENCH SCREWS

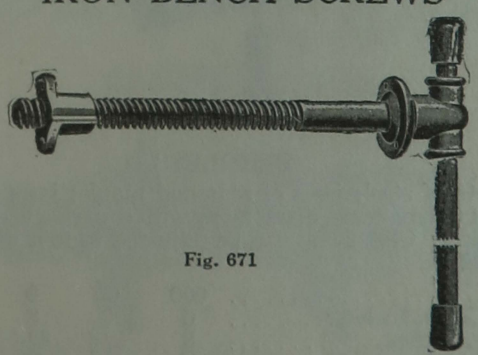


Fig. 671

Screw and socket of wrought iron, japanned; double thread; movable collar; plain hickory handle, 12 inches long with one removable knob.

Diameter Screw, Inches	1	1 1/8	1 1/4	1 1/2
Length Over All, Inches	16	16 1/4	17	18 1/4
Weight per Dozen, Lbs.	68	80	95	150
Per Dozen	$6.90	7.50	9.00	14.00

WOOD HAND SCREWS

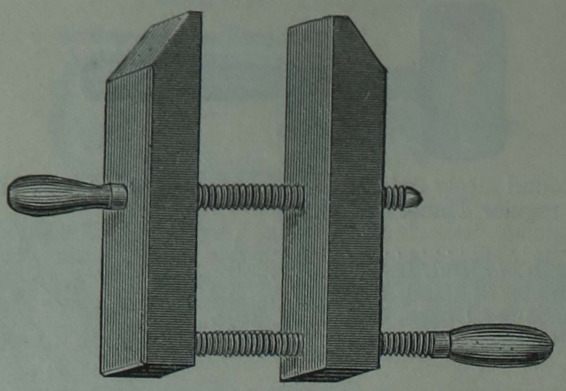


Fig. 672

Seasoned maple jaws; selected hickory screws; oil finish.

No.	Diam. Screw Inches	Length Screw Inches	Length Jaw Inches	Size Jaw Inches	Wgt. per Dozen Opens Inches	Wgt. per Dozen Lbs.	Price per Dozen
800	1¼	28	24	3 x3	17	160	$50.00
801	1¼	26	22	2¾x2¾	15½	138	45.00
802	1¼	24	20	2⅝x2⅝	13¾	120	40.00
803	1¼	22	20	2½x2½	12	111	35.00
804	1⅛	22	18	2½x2½	12¼	103	28.50
805	1⅛	20	18	2⅜x2⅜	10½	100	27.00
806	1	20	16	2⅜x2⅜	11	87	25.00
807	1	18	16	2¼x2¼	9¼	70	23.50
808	⅞	18	14	2⅛x2⅛	10	62	22.00
809	⅞	16	14	2 x2	8¼	45	20.00
810	⅞	16	12	1⅞x1⅞	8½	40	18.50
811	¾	14	12	1¾x1¾	7¼	33	17.00
812	¾	12	10	1⅝x1⅝	5½	20	14.50
813	⅝	10	8	1⅜x1⅜	4½	15	13.00
814	⅝	8	7	1⅛x1⅛	3	13	12.00
815	½	6	5	1 x1	2	10	11.00
816	⅜	5	4	⅞x ⅞	1¼	9	10.00

ADJUSTABLE CLAMPS

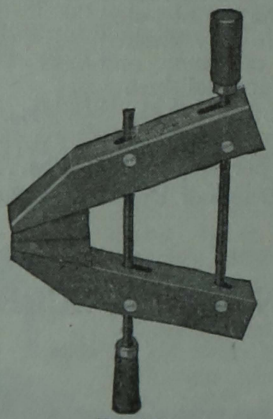


Fig. 673

PEERLESS

Sockets of steel; jaws of seasoned maple; jaws can be adjusted to any angle, doing away with squaring up irregular surfaces. One clamp can be adjusted to four different positions.

NOS.	000	00	0	1
Length Jaws, Inches	6	7	8	10
Opening, Inches	3	3½	4½	6
Weight per Dozen, Lbs.	11	12	23	30
Per Dozen	$10.80	12.00	13.20	15.60

NOS.	2	3	4	5
Length Jaws, Inches	12	14	16	18
Opening, Inches	8½	10	12	14
Weight per Dozen, Lbs.	48	58	85	100
Per Dozen	$17.40	19.20	22.80	26.40

SCREW CLAMPS

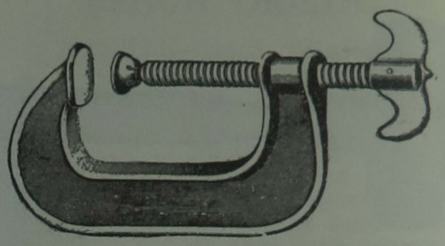


Fig. 674

Malleable iron frame; steel screw with square cut thread; adjustable button to conform to uneven surfaces.

NO. 61

Open, Inches	2½	3	4	5	6
Weight per Dozen, Lbs.	11	15	17	19	21
Per Dozen	$7.00	8.00	11.00	14.00	18.00

Open, Inches	7	8	9	10	12
Weight per Dozen, Lbs.	28	34	50	62	78
Per Dozen	$22.00	28.00	32.00	36.00	46.00

2½, 3, 4 and 5 inch sizes, one half dozen in a box; all others in bulk.

CARRIAGE CLAMPS

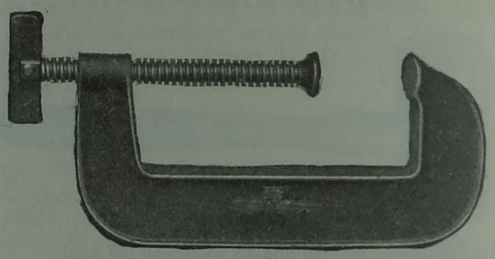


Fig. 675

Frame of malleable iron, heavily reinforced. Large diameter steel screw with deep cut Acme thread of proper pitch for greatest power. Has improved steel wing. Affords better grip than malleable wing and will not break off. Regularly furnished with button tip. Can be furnished with ball and socket tips when specified.

NOS.	536	537	538	539
Open, Inches	2½	3	4	5
Weight per Dozen, Lbs.	9	17	20	26
Per Dozen	$7.00	8.00	11.00	14.00

NOS.	540	541	542	544	545
Open, Inches	6	7	8	10	12
Weight per Dozen, Lbs.	33	44	51	75	108
Per Dozen	$18.00	22.00	28.00	36.00	46.00

2½ to 6 inch sizes, one-half dozen in a box; all others in bulk.

SELF-LOCKING CLAMPS

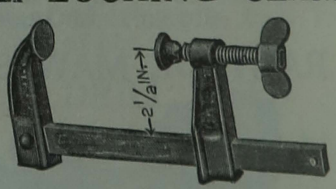


Fig. 676

Adapted to core-box, and pattern work; light furniture repairing. Strong, light weight, with deep engagement; high grade steel bar, ¾x¼ inch; steel screw 3x7/16 inches; with pivoted button, safe clamping strain, 750 Lbs.

NO. 11

Opens, Inches	4	6	8	10	12
Weight per Dozen, Lbs.	14	16	17	18	19
Per Dozen	$8.16	8.40	8.64	8.88	9.12

Opens, Inches	18	24	30	36	48
Weight per Dozen, Lbs.	33	37	40	44	52
Per Dozen	$9.84	10.56	11.28	12.00	13.44

BAR CLAMPS

SCREW TYPES

Light and handy, very powerful for their weight. Suitable for a wide range of work; high-grade steel bar, 1x5/16 inches; steel screw 4x9/16 inches; pivoted button; castings of malleable iron; safe clamping strain, 1800 lbs.

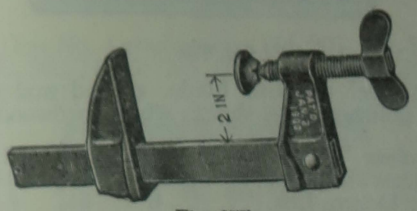


Fig. 677

NO. 14

Stationary Jaw carries screw.

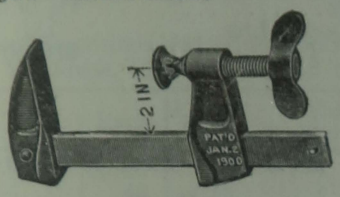


Fig. 678

NO. 15

Sliding jaw carries screw.

NOS. 14 and 15.

Opens, Inches	4	6	8	10	12
Weight per Dozen, Lbs.	28	30	32	34	36
Per Dozen	$11.52	12.00	12.36	12.72	13.20
Opens Inches	18	24	30	36	48
Weight per dozen, Lbs.	42	48	54	60	72
Per Dozen	$14.28	15.36	16.32	17.40	19.56

ECCENTRIC LEVER TYPES

Eccentric lever is combined with self-locking positive grip, making clamps quick and handy for use in many classes of work; all castings of best refined malleable iron; bar of steel, 1x5/16 inch.

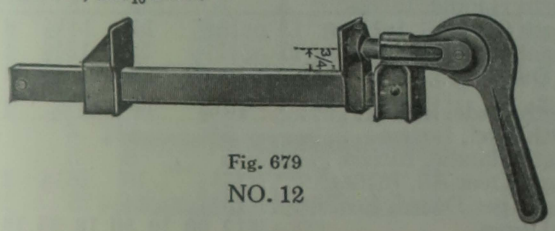


Fig. 679

NO. 12

Designed for clamping chair seats, sashes and cabinet work; clamping surface, 1½ inch high by 1½ inch wide; safe clamping strain 3800 lbs.

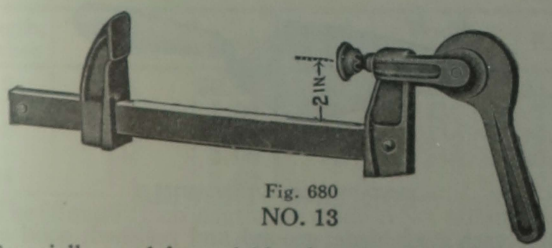


Fig. 680

NO. 13

Especially used for quickly clamping chair backs, etc., where space is limited; pivoted button. Safe clamping strain 1800 lbs.

NOS. 12 and 13

Opens, Inches	8	10	12	18
Weight per Dozen, Lbs.	37	39	41	47
Per Dozen	$13.56	13.92	14.40	15.48
Opens, Inches	24	30	36	48
Weight per Dozen, Lbs.	54	60	67	80
Per Dozen	$16.56	17.52	18.60	20.76

BAR CLAMPS

ADJUSTABLE IRON CLAMPS

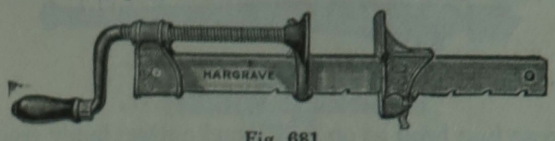


Fig. 681

PERFECTION

For wide clamping such as sash, doors, blinds, furniture, etc.

Frame, tip and slide of malleable iron; bar of high carbon manganese steel; tempered steel dog holds slide at the notches in the bar; crank and screw are one piece of steel with deep cut Acme thread.

REGULAR PATTERN

Bar, 1½x¼ inches; clamping surfaces, 2x1⅞ inches; screw, ⅝ inch in diameter.

NOS.	438	439	440	441
Opens, Feet	2	2½	3	3½
Weight per Pair, Lbs.	12¼	13	15¼	16
Per Pair	$7.60	7.80	8.00	8.50
NOS.	442	443	444	445
Opens, Feet	4	4½	5	6
Weight per Pair, Lbs.	17¾	18¾	19¾	22¼
Per Pair	$9.00	9.50	10.00	11.00

HEAVY PATTERN

Bar, 1¾x⅜ inches; clamping surfaces, 2¼x2¼ inches; screw, ¾ inch in diameter.

NOS.	446	447	448	449
Opens, Feet	3	4	5	6
Weight per Pair, Lbs.	27¼	31½	35½	40
Per Pair	$16.50	17.00	18.00	19.00
NOS.	450	451	452	453
Opens, Feet	7	8	9	10
Weight per Pair, Lbs.	44¾	50	54¼	57¾
Per Pair	$20.50	22.00	25.00	28.00

JOINERS' CLAMPS

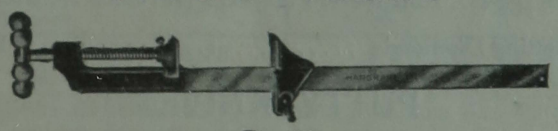


Fig. 682

For narrow glueing and clamping where speed is of more importance than power. The frame tip, wheel and slide are of malleable iron. Bar of manganese steel, is notched on under side to engage slide dog. Parts will not break, slip or bind. Bar 1⅛x3/16 inches; clamping surface 1¼x1⅜ inches; screw ½ inch in diameter, Acme thread.

NOS.	458	459	460	461	462
Opens, Feet	1	1½	2	2½	3
Weight per Pair, Lbs	6	6¾	7¾	8¼	9
Per Pair	$6.60	6.80	7.00	7.20	7.40

CLAMP HEADS

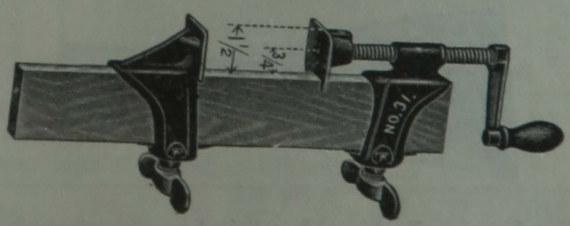


Fig. 683

NO. 31

For cabinet and light sash and door work, and for holding a joint after it is made. A turn of set screws tightens or releases the grip. All castings of malleable iron. For use on 2¼x⅞ inch wood bars, any length.

	Per Dozen
NO. 31—Weight per Dozen, 27 Lbs.	$15.00

GLASS CUTTERS

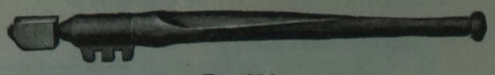


Fig. 684

SINGLE WHEEL

Loose iron head as on a diamond cutter; fancy tropical wood handle; perfect cutting wheel, carefully tempered and ground with precision.

	Per Dozen
NO. 0—Length, 7 Inches; Weight per Dozen, 1 Lb.	$2.55

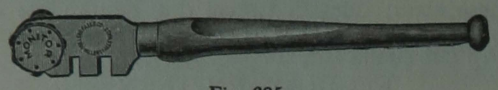


Fig. 685

MULTIPLE WHEEL

Pressed steel head; steel revolving turret; polished and nickeled; steel cutter wheels scientifically hardened and carefully tested; polished fancy tropical wood handle; seven cutting wheels affixed to turret.

	Per Dozen
NO. 100—Length, 5½ Inches; Weight per Dozen, 14 Ounces	$6.60

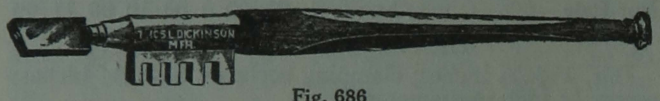


Fig. 686

DIAMOND

Glass cutters set with diamond points. Whole sparks of the very best quality are used and set with special care. Can be reset a number of times.

	Each
Style A—With Rack for Use on Ordinary Glass	$5.00
Style B—With Rack for Single and Double Thick Glass	6.00
Style C—With Rack and Heavy Block for All Kinds of Glass	7.00
Style D—For Rough and Polished Plate Glass	8.00 to 25.00
Resetting Diamonds	1.50

PUTTY KNIVES

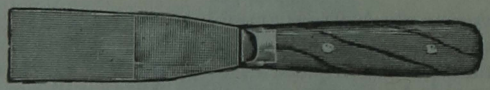


Fig. 687

Cocobolo handles; forged, polished crucible steel blades either stiff or flexible.

	Per Dozen
NO. 1540—Blade, 3⅝ Inches Long, 1 5/16 Inches Wide, Weight per Dozen, 2¼ Lbs.	$....

SCRAPING KNIVES

Fig. 688

Cocobolo handles; forged, polished crucible steel blades, either flexible or stiff.

NO. 525

Width, Inches	2½	3	3½	4
Length, Inches	7¾	7¾	7¾	8¼
Weight per Dozen, Lbs.	3	3½	3¾	4
Per Dozen	$....	....	....	....

All Above, One Dozen in a Box

PLASTERING TROWELS

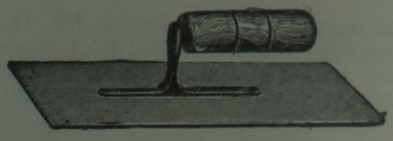


Fig. 689

Crucible steel polished blade, ground and tempered, riveted to polished steel shank; white hardwood handle.

Length, Inches	10	10½	11	11½
Width, Inches	4½	4½	4¾	4¾
Weight per Dozen, Lbs.	6	6¼	6½	7
Per Dozen	$12.00	13.00	14.00	15.25

Length, Inches	12	12½	13
Width, Inches	4¾ or 5	5¼	5½
Weight per Dozen, Lbs.	7¼	7½	8
Per Dozen	$16.50	18.00	19.50

BRICK TROWELS

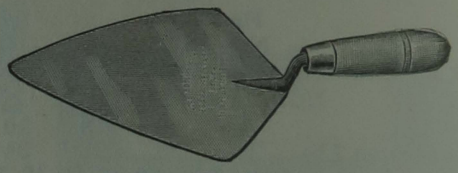


Fig. 690

EXTRA BROAD

Extra grade crucible steel, polished and tempered; single steel ferrule, natural finish steel shank; wide heel; natural finish wood handles.

NO. 185

Length Blade, Inches	8	8½	9	9½	10
Width Heel, Inches	4 5/8	4¾	5	5¼	5½
Length Handle, Inches	5	5	5	5	5
Length Over All, Inches	13	13½	14	14½	15
Weight per Dozen, Lbs.	11	11½	12	12½	13
Per Dozen	$9.50	10.00	10.50	11.00	11.50

Length Blade, Inches	10½	11	11½	12
Width Heel, Inches	5 5/8	5 7/8	6	6¼
Length Handle, Inches	5	5	5	5
Length Over All, Inches	15½	16	16½	17
Weight per Dozen, Lbs.	13¾	14½	15	15¾
Per Dozen	$12.00	12.50	13.25	14.00

All Above, One-half Dozen in a Box

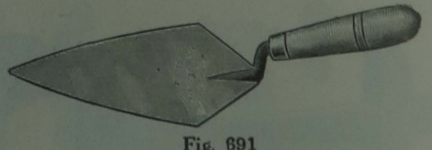


Fig. 691

POINTING TROWELS

Best cast steel blade, ground and polished; solid steel shank; steel ferrule, hardwood handle.

NO. 182

Length Blade, Inches	3	4	5	6	7
Width Heel, Inches	1¾	2 1/8	2 3/8	2¾	3
Length Handle, Inches	4¼	4¼	4¼	4¼	4¼
Length Over All, Inches	7¼	8¼	9¼	10¼	11¼
Weight per Dozen, Lbs.	2¼	2¾	2	3½	3¾
Per Dozen	$2.85	2.95	3.10	3.40	3.80

One Dozen in a Box

SPRING-TEMPERED STEEL RULES

These rules are made to agree with the accurate standards furnished by the U. S. Government. Are of spring-tempered steel in many convenient forms for all work.

Fig. 692

No. 300 has No. 4 graduation; No. 301, No. 1; No. 302, No. 2; No. 306, No. 6; No. 307, No. 7; No. 308, No. 15; No. 309, No. 16.

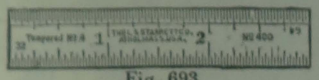


Fig. 693

WITH ONE BEVELED EDGE

No. 400 has No. 4 graduation, with 64ths on beveled edge; No. 407 has No. 7 graduation, with 100ths on beveled edge.

The following dimensions and prices apply to all of the above rules. Thickness, 3/64 inch or No. 18 gauge.

Length, Inches	Width, Inches	Each	Length, Inches	Width, Inches	Each
1	1/2	$0.25	12	1	$1.50
2	1/2	.40	18	1 1/8	2.40
3	9/16	.50	24	1 1/4	3.00
4	5/8	.60	36	1 1/4	6.00
6	3/4	.80	48	1 1/4	8.40
9	7/8	1.20	..	...	....

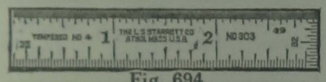


Fig. 694

No. 303 with graduated end has No. 4 graduation, and is graduated in 32nds of an inch on opposite sides of one end. No. 403 with one edge beveled has No. 4 graduation, with 64ths on beveled edge, and graduated in 32nds on opposite sides of one end.

Length, Inches	Width, Inches	Each	Length, Inches	Width, Inches	Each
2	1/2	$0.40	9	7/8	$1.20
3	9/16	.50	12	1	1.50
4	5/8	.60	18	1 1/8	2.40
6	3/4	.80	24	1 1/4	3.00

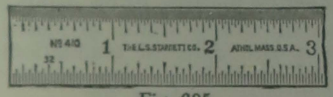


Fig. 695

HEAVY

About 1/10 inch thick. No. 410 has No. 4 graduation; No. 417, No. 7.

Length, Inches	Width, Inches	Each	Length, Inches	Width, Inches	Each
6	3/4	$0.65	36	1 1/2	$5.00
9	1	1.00	48	1 1/2	7.00
12	1 1/4	1.25	*60	1 1/2	16.00
18	1 1/4	2.00	*72	1 1/2	20.00
24	1 1/4	2.50	..	...	....

*The 60 and 72 inch lengths are made in No. 410 style only.

Fig. 696

FLEXIBLE

Extremely thin. Will easily conform to a 2-inch circle. No. 320 has No. 10 graduation; No. 321, No. 11; No. 322, No. 12; No. 323, No. 13; No. 324, No. 14.

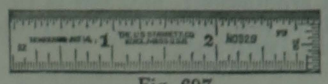


Fig. 697

SEMI-FLEXIBLE

About 1/40 inch thick; heavier than flexible rules and lighter than regular rules. Made in sizes, 2-inch to 12-inch lengths only.

The following dimensions and prices apply to all of the above rules.

Length, Inches	Width, Inches	Each	Length, Inches	Width, Inches	Each
1	1/2	$0.25	12	1/2	$1.50
2	1/2	.40	18	3/4	2.40
3	1/2	.50	24	3/4	3.00
4	1/2	.60	36	3/4	6.00
6	1/2	.80	48	3/4	8.40
9	1/2	1.20	..	..	....

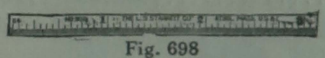


Fig. 698

NARROW RULES

About 3/16 inch wide. No. 18 gauge, No. 10, 11 or 12 graduation.

Length, Inches	Each	Length, Inches	Each
4	$0.60	9	$1.20
6	.80	12	1.50

All the above rules 1 to 12 inches, six in a box, 18 inch and up, one in a package.

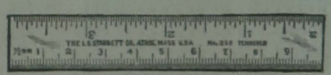


Fig. 699

METRIC AND ENGLISH

No. 350 graduated one corner each in millimeters, 1/2 millimeters, 32nds and 64ths.

Length, Cm.	Length, Inches	Each	Length, Cm.	Length, Inches	Each
5	1.9685	$0.40	40	15.7480	$2.00
10	3.9374	.60	50	19.6850	2.40
15	5.9055	.80	60	23.6220	3.00
20	7.8740	1.05	80	31.4960	6.00
25	9.8425	1.30	100	39.3700	8.40
30	11.8110	1.50	...	.....	....

Rules 5 to 30 cm., six in a box; 40 cm. and up are in a package.

GRADUATIONS—Rules are divided into parts of an inch as follows:

NOS.	1st Corner	2d Corner	3d Corner	4th Corner	NOS.	1st Corner	2d Corner	3d Corner	4th Corner
1	10,20,50,100	12,24,48	16,32,64	14,28	11	64	100	..	...
2	10,20,50,100	12,24,48	16,32,64	8	12	50	100	..	...
4	64	32	16	8	13	8	16	..	...
6	32	48	50	64	14	8	32	..	...
7	64	32	16	100	15	10	20	50	100
10	32	64	..	...	16	32	64	50	100

SPRING TEMPERED STEEL RULES

Made to agree with the accurate standards furnished by the U. S. Government.

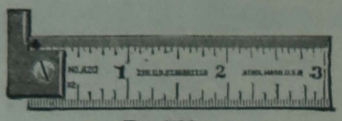


Fig. 700

IMPROVED HOOK RULES

Convenient in taking measurements from rounded corners, through hubs of pulleys, setting inside calipers, etc. No. 419 is the No. 303 rule, No. 4 graduation, with hook and with end graduation; No. 420 is the No. 300 rule, No. 4 graduation, with hook; No. 421 is the No. 410 rule, No. 4 graduation, with hook.

Length, Inches	6	9	12
Each	$1.20	1.70	2.10
Length, Inches	18	24	36
Each	$3.00	3.60	6.90

Hooks can be applied to rules of other graduations at the same prices.

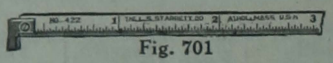


Fig. 701

NARROW HOOK RULES

Designed for use in taking measurements through holes as small as 3/8 inch, where the regular hook rules cannot be used. No. 422, graduated one side in 32nds and the other 64ths of an inch.

Length, Inches	4	6	9	12
Each	$0.90	1.10	1.50	1.80

Can be supplied with Nos. 11 or 12 graduations at the same prices.

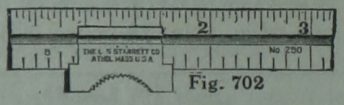


Fig. 702

THUMB SLIDE RULES

Fitted with thumb slide. Useful in measuring against a shoulder, the width of flanges, collars, etc.

NOS.	290	291	292	297
Length, Inches	6	6	6	6
Width, Inch	9/16	9/16	9/16	9/16
Thickness, Inch	1/16	1/16	1/16	1/16
Graduation, No.	4	1	2	7
Each	$1.50	1.50	1.50	1.50

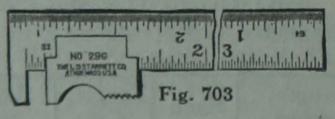


Fig. 703

SLIDE CALIPER RULES

Where many measurements are to be taken on small rods, tubing, etc., it is convenient to have an instrument which measures the object between two contracts. As the caliper square may be too expensive, this slide caliper rule is very satisfactory on this class of work.

Four inches long, about 5/8 inch wide and 1/16 inch thick.

No. 4 graduation	Each
No. 296	$1.80

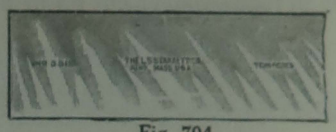


Fig. 704

PLAIN STRAIGHT EDGES—NO. 381

These straight edges are made especially for draftsmen's use; nickel plated; hole in one end; not graduated.

L'gth, Ins.	Width, Ins.	Thickness, In.	Each	L'ght, Ins.	Width, Ins.	Thickness, In.	Each
12	1 3/8	5/64	$1.50	42	1 3/4	3/32	$5.10
15	1 3/8	5/64	1.80	48	2	3/32	7.20
18	1 3/8	5/64	2.10	54	2	3/32	8.40
24	1 1/2	5/64	2.40	60	2	3/32	9.60
30	1 1/2	5/64	3.00	72	2 1/2	7/64	12.00
36	1 3/4	3/32	3.90	..	..	..	....

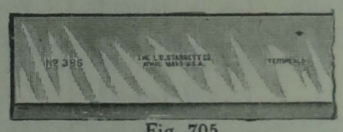


Fig. 705

BEVELED STRAIGHT EDGES—NO. 386

Same as No. 381, except one edge is beveled.

L'gth, Ins.	Width, Ins.	Thickness, In.	Each	L'gth, Ins.	Width, Ins.	Thickness, In.	Each
12	1 3/8	5/64	$2.40	42	1 3/4	3/32	$8.40
15	1 3/8	5/64	3.00	48	2	3/32	6.80
18	1 3/8	5/64	3.60	54	2	3/32	12.00
24	1 1/2	5/64	4.80	60	2	3/32	13.20
30	1 1/2	5/64	6.00	72	2 1/2	7/64	16.50
36	1 3/4	3/32	7.20	..	...	..	....

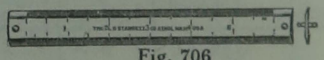


Fig. 706

DRAFTSMEN'S SCALES

No. 405, graduated in 10ths, 40ths, 50ths and 100ths; No. 405A, graduated in 8ths, 16ths, 32nds and 64ths.

Furnished with tilting studs, so placed that each of the four corners with different graduations will come in contact with the paper by its own weight with the back edge raised to an angle of about 30°.

Length, Inches	6	12
Each	$1.20	1.80

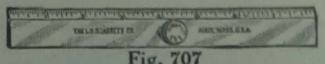


Fig. 707

NEW DESK RULES—NO. 367

Nickel plated; beveled and graduated in 16ths. The knob makes it convenient for picking up.

Length, Inches	8	12
Width, Inch	1	1
Thickness, Inch	3/16	3/16
Each	$1.20	1.80

GRADUATIONS

NOS.	1st Corner	2d Corner	3d Corner	4th Corner	NOS.	1st Corner	2d Corner	3d Corner	4th Corner
1	10,20,50,100	12,24,48	16,32,64	14,28	11	64	100	..	...
2	10,20,50,100	12,24,48	16,32,64	8	12	50	100	..	...
4	64	32	16	8	13	8	16	..	...
6	32	48	50	64	14	8	32	..	...
7	64	32	16	100	15	10	20	50	100
10	32	64	..	...	16	32	64	50	100

FOLDING STEEL RULES

STARRETT

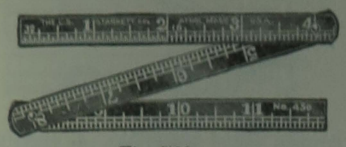


Fig. 708

Made of best quality spring-tempered steel, ⅜ inch wide, raised figures and double lock-joints. Graduated the first 2 inches in 32nds. Remainder in 16ths on one side, reverse side graduated in 8ths entire length.

NO. 450

Length, Inches	12	24
Length Joints, Inches	4	6
No. of Folds	3	4
Each	$0.30	.60

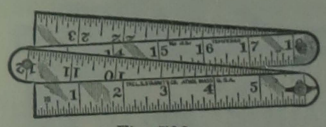


Fig. 709

Made of best quality spring-tempered steel in 6 inch sections, ¾ inch wide, accurately graduated in 8ths on one side, 16ths on other, with large figures for easy reading.

NO. 451

Length, Inches	24	36	48	72	96
No. of Folds	4	6	8	12	16
Each	$1.80	2.40	3.00	6.00	8.40

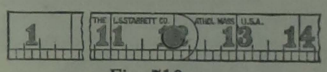


Fig. 710

BLACKSMITHS'

Folding, made of best quality spring-tempered steel. Lock joints, large raised figures. Graduated in 8ths on one side, and 16ths on the other.

NO. 460

Length, Inches	24	36
Length Joints, Inches	12	12
No. of Folds	2	3
Each	$0.60	.90

CENTER GAUGES

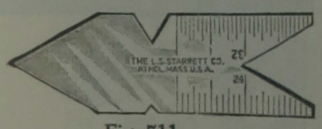


Fig. 711

For use in grinding and setting screw cutting tools. The angles are 60° except in Nos. 395 and 396, in which they are 55°.

No. 390 is not tempered; graduated one corner each in 32nds, 24ths, 20ths, and 14ths. No. 391 is spring-tempered. No. 395 Whitworth is not tempered, while No. 396 Whitworth is spring-tempered. No. 397 metric, not tempered. No. 398 metric, spring-tempered.

Each, Not Tempered	$0.35
Each, Spring-Tempered	.50

KEY-SEAT RULES

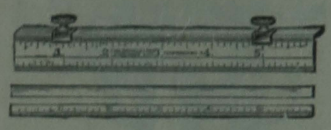


Fig. 712

An improvement over the ordinary type in that the machinists' scale is used as part of the key-seat rule. This is made possible by a device which holds two straight edges together in the form of a box square. One of these rules is a plain straight edge and the other the rule with which the machinist ordinarily works. The two edges forming the box square when applied to the surface of the cylindrical piece keep the graduated edge of the rule in a line parallel with the axis.

No. 105B has auxiliary straight edge, plain. No. 105C has auxiliary straight edge, graduated.

Length, Inches	6	9
NO. 105A, Each	$2.70	3.60
NO. 105B, Each	$3.30	4.50
NO. 105C, Each	$3.60	5.10

Unless otherwise designated No. 105A will be sent.

KEY-SEAT CLAMPS

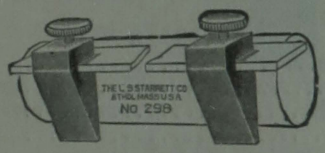


Fig. 713

NO. 298

Designed to transform any common steel scale into a key-seat rule. They can be put on or off almost instantly, and are a complete substitute for a more costly tool. They may be used with combination square blades, or with any straight rule, with accurate results.

Per Pair $0.75

RULE CLAMPS

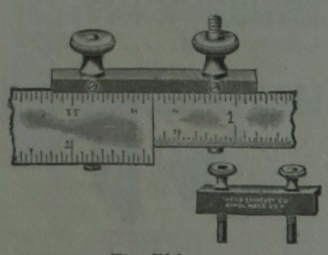


Fig. 714

NO. 299

Used to clamp two steel rules together, end to end, making one long rule. Rules may be of the same or different widths up to 1¼ inches. It is of special value to mechanics, whose tool chests will usually not hold rules longer than 12 inches.

Each $0.60

COMBINATION SQUARES

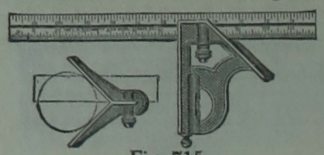


Fig. 715

With the adjustable scale this forms one of the most convenient and useful tools ever devised for mechanics' use. With hardened blades, No. 4 graduation.

NO. 11

Length, Inches	4	6	9
Weight Each, Ozs.	2½	7½	9
Each, with Center Head	$2.10	2.40	3.00
Each, without Center Head	$1.50	1.80	2.05
Length, Inches	12	18	24
Weight Each, Ozs.	16½	19½	21½
Each, with Center Head	$3.60	4.50	5.40
Each, without Center Head	$3.00	3.90	4.80

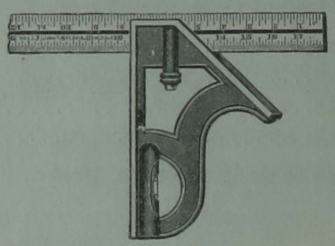


Fig. 716

Similar to No. 11, but is heavier and larger. For those who wish to keep a reliable standard. Hardened blade; without center head.

NO. 8

Length, Inches	18	24
Width, Inches	1½	1½
Thickness, Inch	1/10	1/10
Stock, Inches	8¼	8¼
Weight Each, Ozs.	40½	45
Each	$7.50	9.00
Center Head Only	$1.50	1.50

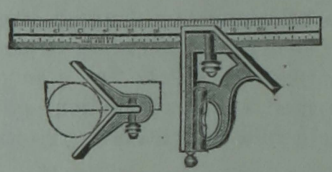


Fig. 717

Similar in design to No. 11, but while the blade is made from good, hard steel, it is not hardened.

NO. 23

Length, Inches	6	9	12
Weight Each, Ozs.	10	15	22
Each, with Center Head	$2.40	3.00	3.60
Each, without Center Head	$1.80	2.40	3.00

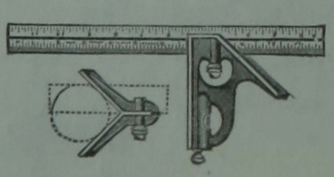


Fig. 718

Stock and center head of drop forged steel, hardened; blade, hardened and graduated with heavy figures reading both ways. Blades graduated in Nos. 1, 2, 4, 7 and 16 graduations.

NO. 33

Length, Inches	6	9	12	18	24
Weight Each, Ozs.	8½	12½	17	19½	22
Each, with Center Head	$3.90	4.50	4.80	6.00	6.60
Each, without Center Head	$3.00	3.60	3.90	5.10	5.70

IMPROVED BEVEL PROTRACTORS

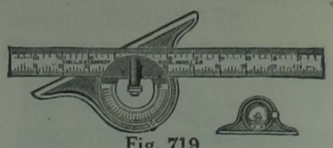


Fig. 719

Sent with center head and No. 4 graduation, unless otherwise ordered.

An adjustable rule, held firmly at any point by a thumb nut, passes through a revolving turret, which is nicely graduated in degrees from 0 to 180, both right and left.

NO. 12

Length, Inches	9	12	18	24
Weight Each, Ozs.	13	15	17	20
Each	$4.50	5.10	6.00	6.90
Protractor Head Only, with Level Attachment				$3.00

COMBINATION SETS

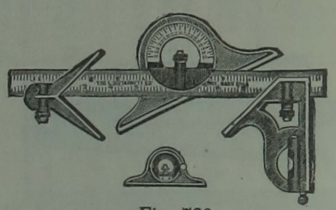


Fig. 720

Consists of No. 11 combination square and 7-inch bevel protractor No. 12.

NO. 9

Length, Inches	9	12	18	24
Weight Each, Ozs.	25	30	30	32
Each	$6.00	6.60	7.30	8.40

INCLINOMETERS

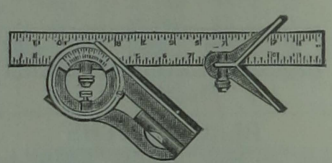


Fig. 721

An inclinometer, try square and bevel protractor combined; compact and convenient. Has a stock and disc, both slotted to receive the blade which folds in the stock. The blade attached to the graduated rotary disc may be secured at any angle from 0 to 90 degrees, No. 4 graduation.

NO. 10

Length, Inches	12	18	24
Weight Each, Ozs.	18	20½	22½
Each, without center head	$4.80	6.00	7.20
Centre Head to Fit All Sizes, Each			$0.90

PATENT PROTRACTORS

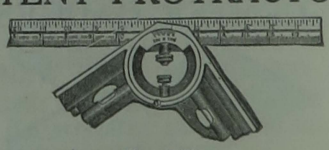


Fig. 722

Blade closes in the stock either way against a stop, making a perfect square, plumb and bevel. Without the blade the stock may be used in contracted places as a 6-inch level and plumb, while with an 18 or 24-inch blade, a level and plumb of corresponding length is obtained.

NO. 16

Length, Inches	12	18	24
Weight Each, Lbs.	23½	26	28
Each	$5.70	6.60	7.20
Stock Only, Each			$4.20

The 12, 18 and 24-Inch blades of the combination squares will fit the protractor stock, but the 18 and 24-inch lengths are best adapted for this tool.

DOUBLE SQUARES

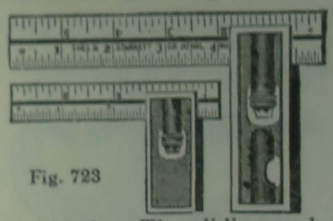


Fig. 723

With hardened blade. The sliding scale, shortened or extended full length, makes it more valuable than a full set of the common kind.

Graduated in Nos. 4, 1, 2, 17 and 16 graduations. No. 4 graduations will be sent unless otherwise specified.

A level is contained in the 6, 9 and 12-inch sizes.

NO. 13

Size, Inches	4	6	9	12
Each	$1.50	2.40	3.60	4.80

Note—Combination hexagon and octagon bevel blades furnished with 4 and 6-inch sizes on all orders unless otherwise specified at the following prices:—4 Inch, $2.00, 6 Inch, $3.00.

DOUBLE STEEL SQUARES

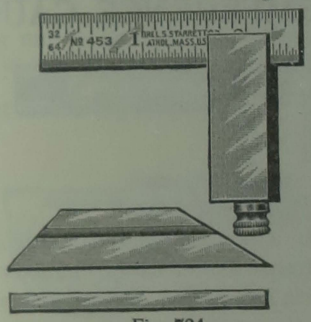


Fig. 724

A double steel square with patent 2½-inch sliding scale, and is especially designed for fine tool makers. Graduated on one side only, in 32nds and 64ths.

No. 14A is square only. No. 14B is square with either bevel or narrow blade. No. 14C is square with both level and narrow blade. No. 14C sent unless otherwise specified.

NO. 14

NOS.	14A	14B	14C
Weight Each, Ounces	½	2	.....
Each	$3.60	3.90	4.20

TRY SQUARES

RELIABLE

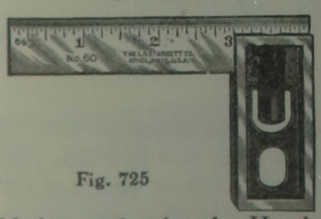


Fig. 725

Graduated blade, not hardened. Handsome in design, light and convenient. The blade is not riveted or soldered to the stock, but is firmly held by a patent bolt and nut by means of which the tool may be readily taken apart, and when worn the blade and stock can be reground, or lapped and put together again as good as new.

NO. 60

Length Blade, Inches*	4	5	6	9	12
Length Beam, Inches	2 5/16	3	3 5/8	5 1/16	6
Weight Each, Ounces	3	4½	6½	11	16
Each	$1.20	1.40	1.50	2.40	3.30

*Blade is measured from inside of beam.

TRY SQUARES

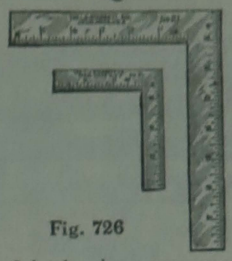


Fig. 726

The 2x1 and 3x2-inch sizes are graduated 16ths and 64ths on one side and 32nds and 64ths on other side. All other sizes are graduated 16ths and 32nds both sides.

NO. 21

Size, Inches	2x1	3x2	4x3	6x4
Thickness, Inch	1/20	1/20	1/16	1/16
Weight Each, Ounces	½	1	1½	2
Each	$2.10	2.70	3.60	5.10
Size, Inches		8x6	10x8	12x10
Thickness, Inch		1/16	1/16	3/32
Weight Each, Ounces		4½	6½	13
Each		$6.60	8.10	9.60

PLAIN STEEL SQUARES

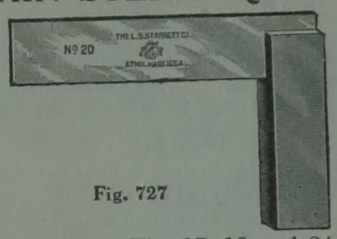


Fig. 727

With hardened edge. The 15, 18 and 24-inch sizes are provided with stock supports.

NO. 20

Length Blade, Inches*	1	1½	2	3
Length Beam, Inches	1	1½	1⅞	2⅜
Each	$3.00	3.60	3.90	4.50
Length Blade, Inches*	4½	6	9	12
Length Beam, Inches	3½	4 5/16	5 9/16	7
Each	$6.90	9.00	13.50	18.00
Length Blade, Inches*		15	18	24
Length Beam, Inches		8 5/8	10½	12 5/16
Each		$30.00	34.50	45.00

*Blade is measured from inside of beam.

GRADUATED STEEL SQUARES

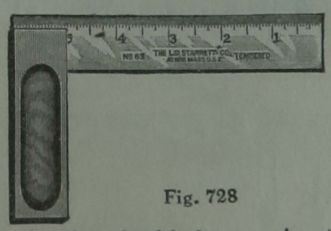


Fig. 728

Stock, case hardened; blades, spring-tempered and graduated in 32nds on one side and 64ths on the other. This tool has concave depressions in each side of the stock, which not only reduce its weight, but make it more convenient to hold between the thumb and finger while being used.

NO. 63

Blade, Inches*	2	3	4
Beam, Inches	1½	2	2¾
Each	$2.70	3.90	5.70
Blade, Inches*	6	9	12
Beam, Inches	3¾	5	6½
Each	$7.50	12.00	14.40

*Blade is measured from inside of beam.

POCKET SLIDE CALIPERS

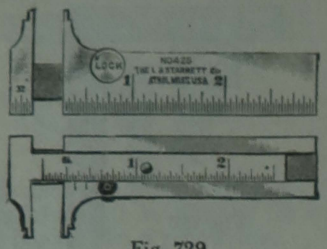


Fig. 729

The improved clamping device is a valuable feature. No. 425 graduated in 32ds and 64ths. No. 425A, graduated 32ds on stock, 100ths on slide.

Specify style in ordering.

Length, Inches	3	5
Weight Each, Ozs.	1	3
NO. 425, Each	$4.00	5.00
NO. 425A, Each	$4.00	5.00

BUTTON GAUGES

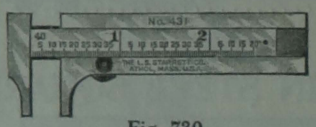


Fig. 730

This gauge is of the same size and is similar to the No. 425 pocket slide caliper. The difference is that it is graduated on the slide only to 40ths of an Inch.

NO. 431

Length, Inches	3	5
Weight Each, Ozs.	1	2
Each	$3.60	4.80

CALIPER SQUARES

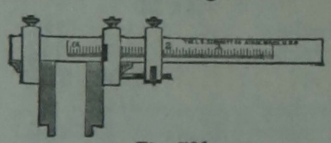


Fig. 731

For both outside and inside measure. The beam is graduated in 64ths on one side and 100ths on the other.

NO. 25

Length, Inches	3	4	6
Weight Each, Ozs.	2	2½	3
Each, with Adj. Screw	$8.00	10.20	12.00
Each, without Adj. Screw	$7.00	9.00	10.00

With hardened jaws, extra, $1.80. In leather case, extra $1.20. Sent with adjusting screw and without case, unless otherwise specified.

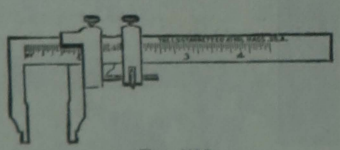


Fig. 732

For both outside and inside measure. The beam is graduated in 64ths on one side and 100ths on the other.

By means of the adjusting screw, the sliding head can be set more accurately to the graduations.

NO. 426

Length, Inches	3	4	6
Weight Each, Ozs.	2	2½	3
Each, with Adj. Screw	$8.00	10.20	12.00
Each, without Adj. Screw	$7.00	9.00	10.00

With hardened jaws, extra, $1.80. In leather case, extra, $1.20. Sent with adjusting screw and without case, unless otherwise ordered.

CALIPER SQUARES

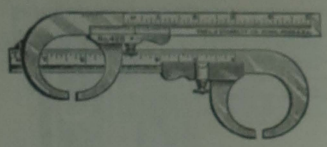


Fig. 733

NO. 428 Plain—3

Length, Inches	4	6
Length Over All, Inches	7 9/16	9 9/16
Each	$5.10	7.50
Each, in Leather Case	$6.90	9.00

Adjustable—3

Length, Inches	4	6
Length Over All, Inches	8 3/16	10 3/16
Each	$7.20	9.30
Each, in Leather Case	$8.40	10.80

SLIDE RULE CALIPER AND CIRCUMFERENCE GAUGES

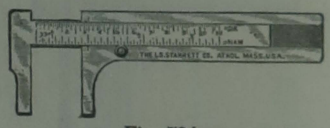


Fig. 734

This gauge has a double function, being graduated to read the circumference as well as the diameter of the article measured, the relation of the circumference to diameter being shown by the graduations on upper corners of the rule. Capacity 3½ inches, about 11 inches in circumference. Makes a first-class slide rule caliper of large scope.

	Each
NO. 424—Depth Jaws, 1 5/16 Inches; Opens, 3½ Inches	$4.80

MICROMETER CALIPER SQUARES

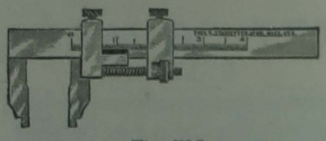


Fig. 735

For outside and inside measure. One side of beam is graduated in 64ths, other side in 40ths. Either side may be used as an ordinary caliper square or through the micrometer, to show 1000ths of an inch at any point within its capacity on either inside or outside work. Special spring between jaw and clasp takes up all pressure and limits the pressure against the work.

NO. 28

Length, Inches	4	6	9	12
Each, with Case	$14.10	17.40	22.50	27.00
Each, without Case	$13.20	16.20	21.00	25.00

Sent without case, unless otherwise specified.

ONE-INCH MICROMETER CALIPERS

For measurement by 1000ths up to 1 inch. Anvil and spindle are hardened, ground and lapped. Decimal equivalents of fractions stamped on the frame.

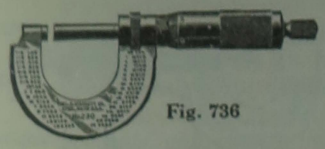


Fig. 736

NO. 230

The anvil is shortened for use in places where the ordinary anvil is too long to be inserted. Has locking nut to lock the spindle at any point and a ratchet stop to regulate pressure on the work.

	Each
NO. 230—Weight Each, 7 Ozs.	$10.00

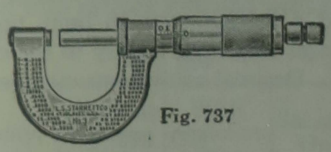


Fig. 737

NO. 3

With locking nut to lock the spindle at any point and a ratchet stop to regulate pressure on the work.

	Each
NO. 3—Weight Each, 4½ Ozs.	$10.00

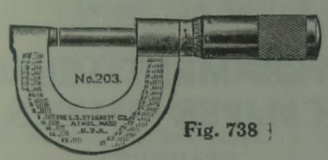


Fig. 738

NO. 203

Without locking nut or ratchet stop.

	Each
NO. 203—Weight Each, 4½ Ozs.	$8.50

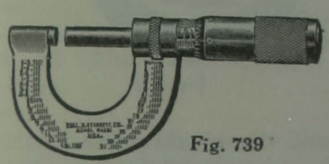


Fig. 739

NO. 201

Has locking nut to lock the spindle at any point, but has no ratchet stop.

	Each
NO. 201—Weight Each, 4½ Ozs.	$9.50

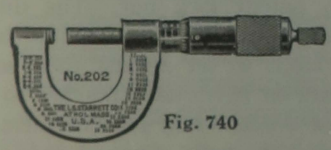


Fig. 740

NO. 202

Equipped with ratchet stop to regulate pressure on the work, but has no locking nut.

	Each
NO. 202—Weight Each, 4½ Ozs.	$9.00

Leather cases will be furnished with any of the above micrometers at an additional charge of $1.00.

Sent without cases unless otherwise ordered.

All above, one in a box.

Any of the above micrometers can be furnished to measure by 10,000ths of an inch at an extra charge of $1.00.

TWO-INCH MICROMETER CALIPERS

For measurement by 1000ths from 1 inch to 2 inches. Each micrometer furnished with a 1-inch test gauge. Anvil and spindle hardened, ground and lapped. Decimal equivalents stamped on frame.

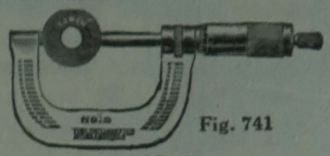


Fig. 741

NO. 2

With locking nut to lock the spindle at any point and a ratchet stop to regulate the pressure on the work.

	Each
NO. 2—Weight Each, 10 Ozs.	$11.00
Extra for Leather Case	1.25

ATTACHMENTS FOR 2-INCH MICROMETERS

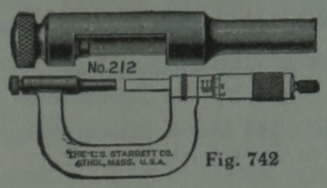


Fig. 742

No. 212

This attachment instantly converts a 2-inch micrometer into a 1-inch tool. Will fit any of our 2-inch micrometers except the No. 226.

	Each
NO. 212—Weight Each, ½ Oz.	$3.00

HALF-INCH MICROMETER CALIPERS

For measurements by 1000ths up to ½-inch. Anvil and spindle hardened, ground and lapped. Decimal equivalents of fractions stamped on frame.

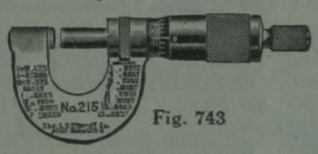


Fig. 743

NO. 215

With locking nut to lock the spindle at any point and ratchet stop to regulate pressure on the work.

	Each
NO. 215—Weight Each, 3 Ozs.	$8.50
Extra for Leather Case	1.00

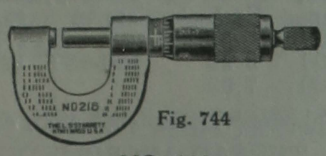


Fig. 744

NO. 216

Without locking nut, but with ratchet stop for regulating pressure on the work.

	Each
NO. 216—Weight Each, 3 Ozs.	$7.50
Extra for Leather Case	1.00

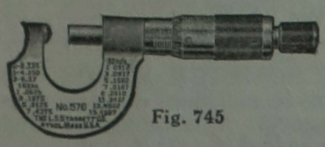


Fig. 745

NO. 576—For Tubing

Anvil is shortened and the face is rounded for accurate measurement of thickness of tubing. With ratchet stop.

	Each
NO. 576—Weight Each, 3 Ozs.	$8.50

MICROMETER CALIPERS

ALMOND

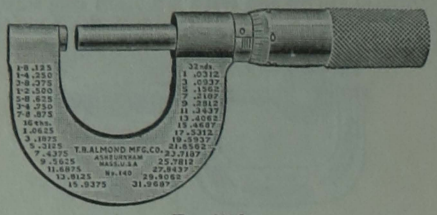


Fig. 746

Made with the utmost care and of the best of materials, these micrometer calipers recognize comparison only with Johansson Swedish Gauges. Anvil and spindle are properly hardened and the adjusting screw is cut to the finest accuracy.

Frame of cast steel with decimal equivalents of fractions stamped on it.

NO. 140 English Measurements

	Each
Capacity, 0 to 1 Inch by Thousandths	$5.50
Capacity, 0 to 1 Inch by Ten Thousandths	6.50

NO. 141 Metric Measurements

Capacity, 0-25 m/m by 1-100ths m/m	5.50

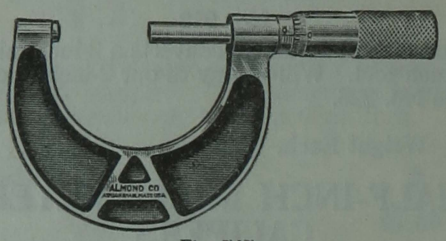


Fig. 747

Construction and operation is same as No. 140-141 type, but frames are of drop forged steel.

NO. 139 English Measurements

Capacity, Inches	Adjustments, Inches	Each	Capacity, Inches	Adjustments, Inches	Each
1–2	1/1000	$5.50	3–4	1/10,000	$8.00
1–2	1/10,000	6.50	4–5	1/1000	7.75
2–3	1/1000	6.50	4–5	1/10,000	8.75
2–3	1/10,000	7.50	5–6	1/1000	8.50
3–4	1/1000	7.00	5–6	1/10,000	9.50

NO. 142 Metric Measurements

Capacity, m/m	Adjustments, m/m	Each	Capacity, m/m	Adjustments, m/m	Each
25–50	1–100	$5.50	100–125	1–100	$7.75
50–75	1–100	6.50	100–150	1–100	8.50
75–100	1–100	7.00			

Micrometer Calipers with Ratchet stop, extra.. 1.00

THREAD MICROMETERS

NO. 137

Capacity, Inches	Range, Threads	Each	Capacity, Inches	Range, Threads	Each
1	8–13	$8.00	2	4½–7	$9.50
1	14–20	8.00	2	8–13	9.50
1	22–30	8.00	2	14–20	9.50
1	32–40	8.00	2	22–30	9.50

For V and U. S. or Whitworth Standard threads.

MICROMETER HEADS ONLY

For attaching to machines or tools where fine adjustment is necessary. Adjustable for slight variations. Ratchet stop supplied if desired.

NO. 138 English Measurements — Each

Capacity, 0 to 1 Inch by Thousandths	$3.50
Capacity, 0 to 1 Inch by Ten Thousandths	4.50

NO. 143 Metric Measurements

Capacity, 0-25 m/m by 1-100ths m/m	$3.50

TAPER GAUGE MICROMETER CALIPERS

STARRETT

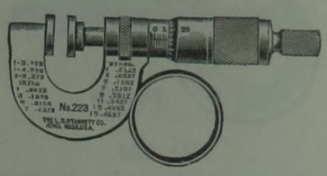


Fig. 748

For measuring thickness of paper, sheet rubber, cardboard, etc. Measures all sizes less than $11\frac{1}{32}$" of an inch by 1000ths. Discs are placed on the anvil and spindle so that measurements can be taken without compressing the articles measured. Has locking nut to lock the spindle at any point and a ratchet stop to limit pressure on the work. The finger ring adds largely to the convenience in using the tool. Decimal equivalents stamped on frame.

NO. 223

Each	$11.00
Each, without Ratchet Stop	10.50
Extra for Leather Case	1.00

U. S. GOVERNMENT MICROMETER CALIPER GAUGES

STARRETT

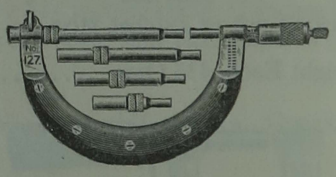


Fig. 749

Made to meet the requirements of the Government shops in making big guns and other work. The frames are cut from steel plates nicely finished. Sides are covered with hard rubber, put on with brass screws, which prevents inaccuracy through expansion caused by change in temperature when held in the hands. The micrometer screw adjusts one inch, reading 1-1000 of an inch, and is provided with patent lock nut. The different length tail, spindles and forming anvils are interchangeable and have positive stops to set against their socketed seats. Adjusting collars on anvils have notches to facilitate the removal of dirt which would prevent them from setting accurately against the seat. Contact ends of spindles are slightly convex to prevent catching on cylindrical work. With ratchet or speeded thumb screw as desired.

NOS.	127A	127B	127C
Size, Inches	0 to 4	4 to 8	8 to 12
Each	$38.50	56.50	75.75

Prices of larger sizes on application.

Each in a Case

MICROMETER CALIPERS

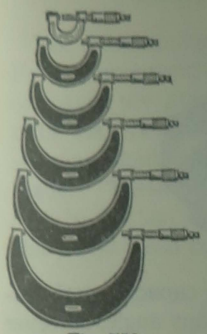


Fig. 750

The frames are drop forged from bar steel and are nicely finished. The 1-inch has the decimal equivalents stamped on the frame. The other sizes are marked to show their capacity. Standards for use in adjusting these calipers will be furnished when desired.

These calipers meet the demand for accurate gauges at a low price. They are better adapted for general use than the vernier or bar micrometer, as they can be set quickly for the different measurements and are more easily read.

Each caliper is graduated to read by 1000ths of an inch, is furnished with patent lock nut, and is sent with or without ratchet stop as desired.

Calipers will be supplied singly or in sets as desired and will be sent with ratchet stop and without leather case or standard unless otherwise ordered.

NO. 226

Size, Inches	Capacity, Inches	Without Ratchet Stop, Each	With Ratchet Stop, Each	Standards Only, Each	Extra for Leather Case
1	0–1	$9.50	$10.00	.....	$1.00
2	1–2	8.50	9.00	$1.50	1.25
3	2–3	10.00	10.50	1.50	1.50
4	3–4	10.75	11.25	1.75	2.50
5	4–5	12.00	12.50	2.00	2.75
6	5–6	13.00	13.50	2.40	3.00

MICROMETER CALIPER SETS

NO. 226A—Comprising No. 650, 1-inch; No. 226, 2 and 3-inch, all without ratchet stop.

Each, without Case.....$26.00
Each, with Case..... 30.00

NO. 226B—Comprising No. 650, 1-inch; No. 226, 2 and 3-inch, all with ratchet stop.

Each, without Case.....$27.50
Each, with Case..... 31.50

NO. 226E—Comprises No. 650, 1-inch; No. 226, 2, 3, 4, 5 and 6-inch, all without ratchet stop.

Each, without Case.....$61.75
Each, with Case..... 69.25

NO. 226F—Comprises No. 650, 1-inch; No. 226, 2, 3, 4, 5 and 6-inch, all with ratchet stop.

Each, without Case.....$64.75
Each, with Case..... 72.25

MICROMETER CALIPER GAUGES

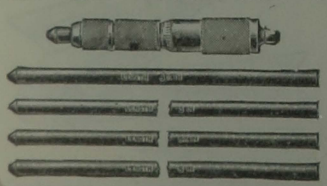


Fig. 751

For close internal measurements indicating 1000ths, where a definite distance in inches is not essential.

Capacity, 2½ to 10 inches "with 5 rods." Sent without case, unless otherwise ordered.

NO. 126

Per Set..... $3.00
Weight per Set, Ozs..... 2½
Extra for Leather Case..... $1.25
Extra Rods, per Inch..... .04

INSIDE MICROMETER CALIPERS

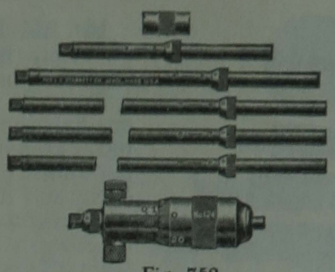


Fig. 752

For internal and linear measurements and for setting calipers, comparing gauges, etc. The micrometer screw in the head has a ½-inch movement and by means of the extension rods furnished, any measurement within the capacity of the set can be made. Standard gauges or rings are furnished to slip on the rods under the collars for further extension. Contact surfaces are all hardened and provision is made for adjustment.

NO. 124A—Capacity, 2 to 8 Inches; contains 6 Rods and a ½-Inch Gauge.

Per Set, with Case..... $8.50
Per Set, without Case..... 7.25

NO. 124B—Capacity, 2 to 12 Inches; contains 10 Rods and a ½-Inch Gauge.

Per Set, with Case.....$10.00
Per Set, without Case..... 8.50

NO. 124C—Capacity, 8 to 32 Inches; contains 4 Rods, a 1-Inch Gauge and a 2-Inch Gauge.

Per Set, with Case.....$12.75
Per Set, without Case..... 10.25

NO. 124D—Capacity, 2 to 32 Inches; comprises Sets A and C.

Per Set, with Case.....$20.50
Per Set, without Case..... 17.50

HANDLES FOR INSIDE MICROMETERS

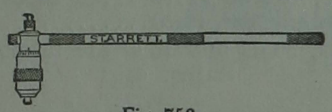


Fig. 753

Auxiliary handle can be used in connection with sets Nos. 124A, 124B and 124D, by removing the nut opposite the lock nut and screwing the handle in place of same, thus fitting the tool for use in places too small for the hand.

Handles Only, Each..... $1.00

ADJUSTABLE CALIPER GAUGES

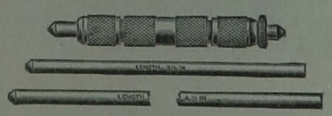


Fig. 754

Designed for internal measurements of large cylinders and of distances between uprights. Made from steel throughout and nicely finished.

NO. 125

Capacity, Inches	Number of Rods	Weight Each, Ozs.	Per Set
2½ to 6¾	3	1½	$1.25
6 to 16	3	3	1.50

Diameter of steel rod, .150 Inch. Extra rods, $0.03 per Inch.

STANDARD END MEASURING RODS

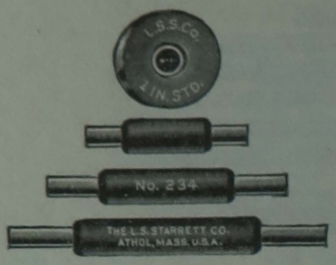


Fig. 755

No. 234 Rods are made of steel, hardened and lapped spherical on the ends with a radius of one-half the length of the rod. Handles are of rubber and guard against expansion due to change of temperature when held in the hands, thereby maintaining their accuracy under adverse conditions. The one inch size is in the form of a round disc Sizes 2 to 6 inches are ¼ inch in diameter with handles 7/16 inch in diameter. Sizes 6 to 12 inches are ⅜ inch in diameter with handles ⅝ inch in diameter

Size, Inches	1	2	3	4	5	6
Each	$1.50	1.95	2.10	2.40	2.70	3.00
Size, Inches	7	8	9	10	11	12
Each	$3.30	3.60	3.90	4.20	4.50	4.80

One in a Box

UNIVERSAL BEVEL PROTRACTORS

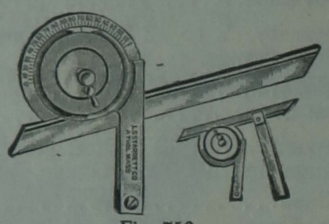


Fig. 756

When angles other than 90° and 45° are to be laid off, a protractor must be used, because all angles are not obtainable with a square or bevel. Any given angle may be laid off or measured with this tool by setting the stock at that angle by the graduated disc.

NO. 360

NOS.	360A	360B	360C	360D	360E	360F
Length, Inches	7	7	12	12	7&12	7&12
Each	$10.00	11.75	11.25	13.25	12.00	14.00

Attachment for any size, Each $1.25

Nos. 360B, 360D and 360F are furnished with leather case

PROTRACTORS

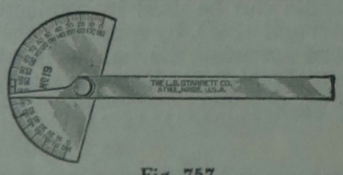


Fig. 757

Graduated in degrees from 0 to 90, both ways. The blade is 6 inches long and, by means of a patent lock joint, is set firmly by a slight turn of the nut. The back of the tool is flat.

NO. 19—Each $2.10

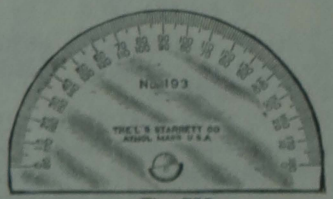


Fig. 758

Used for setting bevels Nos. 15, 47 and 49 at any desired angle, thus converting them into bevel protractors.

NO. 193—Each $1.20

All Above, One in a Box

UNIVERSAL BEVELS

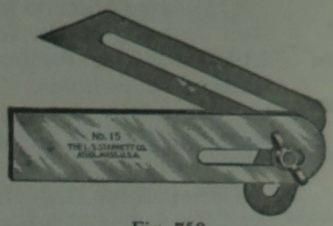


Fig. 759

The set-off in the blade increases its capacity and usefulness for bevel gear work, etc., so that any angle, however slight, may be obtained. One edge of the case being solid, a rest is formed directly under the blade where thin templates may be placed and accurately fitted.

NO. 15—3-Inch, Each $1.50

IMPROVED BEVELS

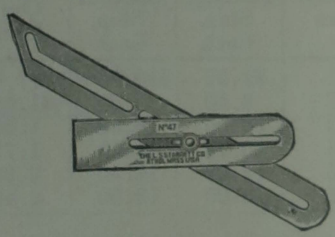


Fig. 760

Has slotted blade and stock, thus admitting of adjustments that cannot be obtained with a common bevel. The clamping screw head is let into a rabbet flush with the surface of the stock, allowing the tool to lie flat on the work.

NO. 47

Size, Inches	6	9	12
Stock, Inches	3½	4¾	6
Each	$1.50	2.00	2.25

COMBINATION BEVELS

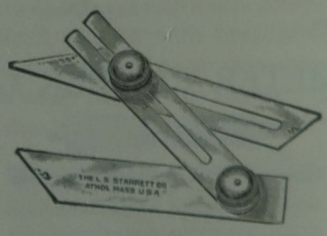


Fig. 761

This Bevel has a stud riveted in the straight edge stock or head, on which its split blade is hinged, so as to swing over the stock and be clamped at any angle. The slotted auxiliary blade with clamp bolt may be slipped on to the split blade and be clamped at any desired angle and used in combination with the stock of the other for laying out work, measuring or showing any angle desired, and when so combined will lie flat upon its work. Stock is about 4 inches long.

NO. 49—Each $2.50

SCREW PITCH GAUGES

For determining the pitch of a thread by comparison. Folds conveniently for carrying in the pocket. Free ends of leaves are made narrow so that threads inside small nuts may be compared. Pitch of thread and decimals showing double depth of thread are stamped on each blade. These pitch gauges are also reliable and convenient to use as a 60-degree center gauge. Teeth are sharp and clean cut.

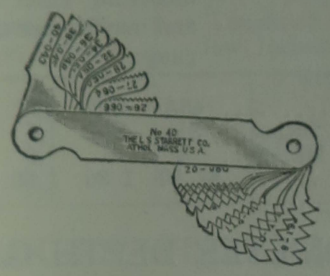


Fig. 762

Has 22 pitches as follows:
9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30, 32, 34, 36, 38, 40.

	Each
NO. 40	$1.25

Of the same form as No. 40, has 26 pitches as follows:
32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82.

	Each
NO. 5	$1.50

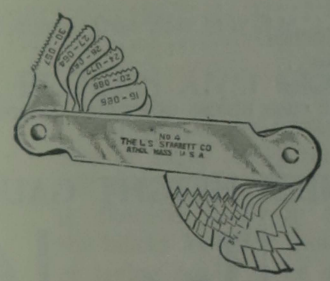


Fig. 763

Has 24 pitches as follows:
4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, 22, 24, 26, 27, 28, 30.

	Each
NO. 4	$1.50

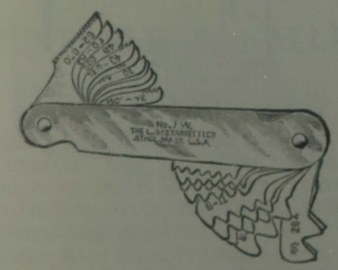


Fig 764

For Whitworth Standard threads. Has 26 pitches as follows:
4, 4½, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, 19, 20, 22, 24, 25, 26, 28, 30, 32, 40, 48 and 60.

	Each
NO. 7	$1.50

All Above, 12 in a Box.

For determining the pitch of a thread by comparison. The teeth are clean cut. Leaves fold in conveniently so that tool may be carried in the pocket.

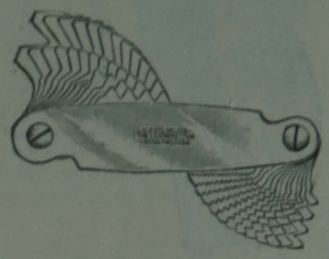


Fig. 765

U. S. Standard. Also a center gauge with coarse and fine notch. Has 25 pitches as follows:
2¼, 2⅜, 2½, 2⅝, 2¾, 2⅞, 3, 3¼, 3½, 4, 4½, 5, 5½, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16, 18, and 20.

	Each
NO. 155	$2.00

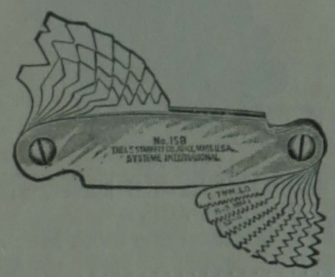


Fig. 766

International Standard. Leaves are stamped to show, on the same leaf, in millimeters, both the pitch and diameter of bolt. Contains a center gauge with coarse and fine notches for grinding thread tools. Has 17 pitches as follows:
.05, 0.75, 1, 1.25, 1.5, 1.75, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7

	Each
NO. 158	$1.25

Metric System. Similar in form to No. 158, but contains more pitches. Has 22 pitches as follows:
1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5, 5.5, 6, 6.5, 7, 7.5, 8, 8.5, 9, 9.5, 10, 10.5, 11, 11.5.

	Each
NO. 159	$1.75

Fig. 767

This form of gauge has a positive stop which holds the blade in a fixed and convenient position for use. It has 30 pitches, V thread, from 6 to 60 as follows:
Nos. 6, 7, 8, 9, 10, 11, 11½, 12, 13, 14, 15, 16, 18, 20, and 22 in one end of the case.
Nos. 24, 26, 27, 28, 30, 32, 34, 36, 38, 40, 42, 48, 50, 56, and 60 in the other.
The number of pitch is stamped on the right side of each blade.

	Each
NO. 473	$1.80

All Above, One in a Box.

THICKNESS GAUGES OR FEELERS

For determining the thickness of sheet metal by comparison.

The thickness of each leaf is designated by the number upon it. Leaves may be used singly or in combination with others.

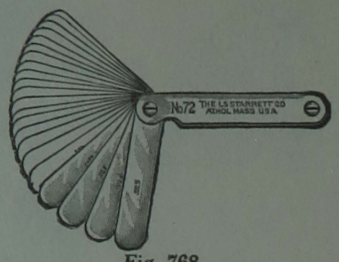


Fig. 768

Has 22 leaves varying in thickness from .004 to .025, varying by 1000ths.

Case is 2¾ inches long and leaves fold within it.

	Each
NO. 72	$2.50

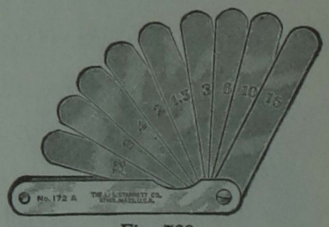


Fig. 769

Nos. 172B and 172C have 8 leaves, viz.: .002, .003, .004, .006, .008, .010, .012, .015.

No. 172A has in addition one more leaf, .0015.

NOS.	172A	172B	172C
Length Case, Inches	3⅜	4¾	6¼
Length Leaves, Inches	3 1/16	4½	6
Each	$1.50	2.50	3.00

No. 172A always sent unless otherwise specified.

PLANER AND SHAPER GAUGES

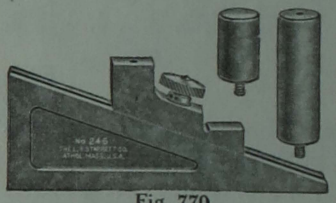


Fig. 770

By setting this gauge with a caliper, micrometer or surface gauge and bringing the planer tool into contact with it, the first cut may be absolutely relied on. This eliminates the cut-and-try method. Level in the base. This gauge with extensions will give any height between ½ and 5½ inches.

	Each
NO. 246	$4.50

DEPTH GAUGES

The wire is held to a groove by a friction spring inside the nut while adjusting, and may be used lose to the end, as well as the middle of the straight edge.

By loosening the nut, the gauge may be neatly folded.

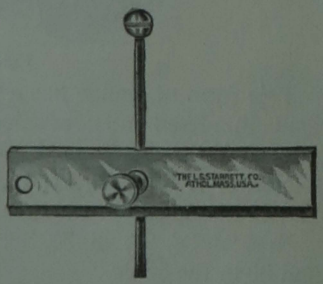


Fig. 771

NO. 45

NOS.	45A	45B	45C
Length Stock, Inches	3½	6	10
Each	$0.90	1.40	1.65

All Above, Each in a Box.

DEPTH GAUGES

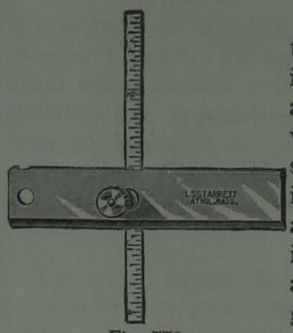


Fig. 772

A 4 or 6-inch steel scale is held to a groove by a friction spring inside the nut while adjusting and may be used at the end as well as in the center of the straight edge. Rules graduated in either 32nds and 64ths, 50ths and 100ths or 64ths and 100ths, indicating exact measurements and may be used separately from gauge.

NOS.	46A	46B	46C	46I	46E
Length Stock, Inches	3½	3½	6	6	10
Length Scale, Inches	4	6	4	6	6
Each	$1.50	1.80	1.80	2.10	2.70

MICROMETER DEPTH GAUGES

For measuring the depth of grooves, holes or irregular parts. Has a ½-inch movement of the screw reading in 1000ths 2, ½-inch and a 1-inch standard collars to slip off or on the spindle. A capacity of 2½ inches by 1000ths can be obtained. Head and measuring rod are hardened.

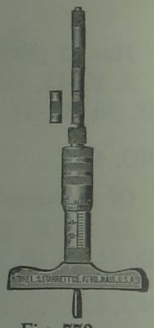


Fig. 773

NOS.	446A	446B
Length Base, Inches	2¼	4
Each, with Case	$8.75	9.75
Each, without Case	$7.75	8.50

Sent without case unless otherwise ordered.

VERNIER HEIGHT GAUGES

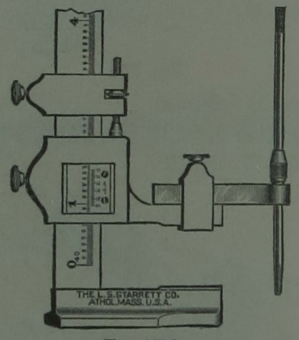


Fig. 774

Measurements by the use of the height gauge are usually made in connection with the tool makers buttons in locating the center distance of bushings of jigs, dies, etc., or in ascertaining the height of projections from a plane surface. Bar is 10 inches long, graduated to read to 1-1000th of an inch, measurements to 8 inches in height. Hardened base 2¾ inches long by 1 inch wide is recessed in the bottom and ground square with the bar. Extension allows measurements being taken from the bottom or top side of the jaw.

	Each
NO. 454A—With Attachment C	$39.75
NO. 454B—Without Attachment	36.00
Attachment C Only	3.75
Plush Lined Case	3.00

No. 454A, with case, sent unless otherwise ordered.

TOOLMAKERS' PARALLEL CLAMPS

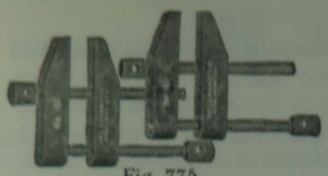


Fig. 775

Made of steel, case hardened. Useful in holding small work together in tapping, drilling, etc.

NOS.	Opening of Jaw, Inches	Length of Jaw, Inches	Per Pair, (2 Clamps)
161AA	3/4	1 5/8	$1.40
161A	1 1/4	2	1.70
161B	1 3/4	2 1/2	2.00
161C	2 1/4	3	2.40
161D	2 3/4	4	2.60

TOOLMAKERS' STEEL CLAMPS

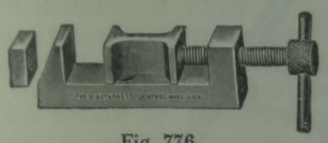


Fig. 776

Made from drop forgings, nicely finished and case-hardened. Take-up blocks slip on and off of screw. They will hold work square and parallel for laying out on surface plates, fitting or drilling. Block may be fastened to bench by means of a hole in the base and used as a vise.

NO. 160

Capacity, Inches	1	2
Per Pair	$2.40	3.00

All Above, One Pair in a Box

DRILL BLOCKS AND CLAMPS

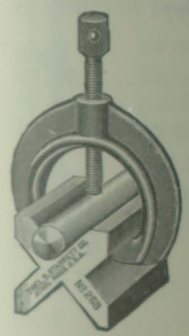


Fig. 777

Drill Blocks are furnished in pairs. Size of each, 2x1 1/2 inches. Clamp will hold a round piece up to 1 1/8 inches in diameter firmly in the groove of the blocks for prick punching, drilling or laying out a series of holes.

NO. 268A—Blocks Only, per Pair, $1.20
NO. 268B—Clamps Only . . Each, $0.60
NO. 268C—Set Complete, per Set, $1.80

Complete Set sent unless otherwise ordered

ADJUSTABLE PARALLELS

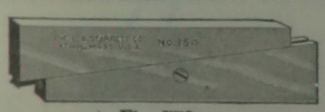


Fig. 778

Convenient for use in connection with milling, planer and shaper vises, taking the place of a large number usually required, also for leveling up work on planer. They give any height from 3/8 to 2 1/4 inches.

NOS.	Length, Inches	Thickness, Inches	Capacity, Inches	Each
154A	1 3/4	9/32	3/8 - 1/2	$0.90
154B	2 1/8	9/32	1/2 - 11/16	1.10
154C	2 11/16	9/32	11/16 - 15/16	1.20
154D	3 3/16	9/32	15/16 - 1 5/16	1.50
154E	4 3/16	9/32	1 15/16 - 1 3/4	1.80
154F	5 1/16	9/32	1 3/4 - 2 1/4	2.10

JACK SCREWS

LITTLE GIANT

Fig. 779

Designed for tool room use, for leveling up work on a planer bed or under an upright drill, setting up machinery, etc. All wearing parts case hardened.

	Per Set Complete
NO. 190—Diameter Base of Jack, 1 1/4 Inches; Range, 2 1/4 to 6 1/2 Inches; Capacity, 1000 Lbs. or more; Extension Bases, 2 Inches and 1 Inch High; Auxiliary Pointed Screw and Special Shape Base	$1.70
NO. 191—Diameter Base of Jack, 1 Inch; Range, 1 1/2 to 3 1/2 Inches; Extension Bases, 1 Inch and 1/2 Inch; Auxiliary Pointed Screw and Special Shape Base	1.70

PARTS

NOS.	190	191
Jack Only	$0.90	.90
Extension Base "B", Each	$0.25	.25
Extension Base "C", Each	$0.20	.20
Auxiliary Screw "D", Each	$0.20	.20
Extension Base "E", Each	$0.20	.20

Sent Complete unless otherwise ordered

TOOLMAKERS' BUTTONS

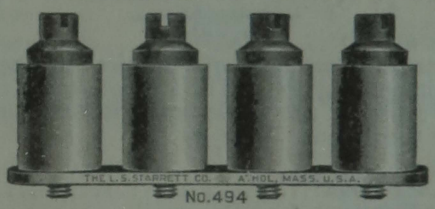


Fig. 780

Buttons are hardened and ground to standard size. Used to locate holes to be chucked and bushed for jigs where positive accuracy is required. Furnished screwed to a small plate.

NOS.	494A	494B	494C
Size, Inches	.300x1/2	.400x1/2	.500x1/2
Per Set	$3.00	3.00	3.00
Size 125-40 Taps for above, Each			$0.25

CENTER TESTERS

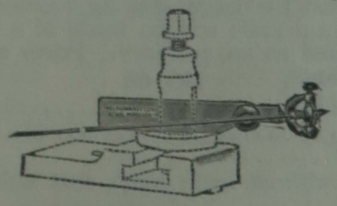


Fig. 781

Designed for use in adjusting and locating centrally any point or hole in a piece of work operated upon in a lathe chuck or on a face plate; also to test the truth of lathe centers or a shaft between the center, the tool being held in the tool post. Improved design and nicely made. Indicating needle passes through the ball, having a split stem, forming a chuck for holding the needle at any desired length. Ball is pivoted to form a universal joint but may be instantly converted into a single joint for tilting motion by tightening the knurled nut.

	Each
NO. 65—Weight Each, 8 1/2 Ounces	$3.00

TEST INDICATORS
UNIVERSAL

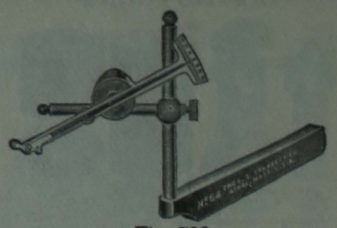


Fig. 782

No. 64

May be used to test inside, outside or surface work. The special holder is designed to go in the tool-post of a lathe, adapting it for use to show the accuracy of all sorts of lathe work, turning, chucking or locating and centering work on face-plate.

The working parts of the head are hardened. In setting the indicator bring the contact point against the work so that the needle will point to 0, when any variation either way will show.

	Per Set Complete
NO. 64—With Indicator, Tool Post Holder and Arm, Weight Each, 9 Ounces	$4.20

PARTS	Each
Indicator Only	$3.00
Tool Post Holder without Arm	.90
Tool Post Holder with Arm	1.20

Always Sent Complete unless otherwise ordered

IMPROVED SCRIBERS

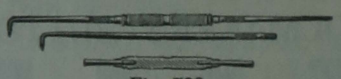


Fig. 783

Points are of a fine grade of steel nicely tempered. All parts are interchangeable. The knurled stock is nickeled and is of sufficient size to be held without cramping or turning in the fingers.

NO. 67	Each
Complete	$0.60
Without Long Point	.45
Long Bent Point	.20
Straight Point or Short Bent Point	.15

Sent Complete unless otherwise ordered

ADJUSTABLE SLEEVE SCRIBERS

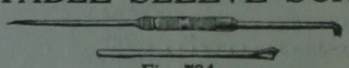


Fig. 784

Knurled sleeve has hole clear through and a clamping device at one end. Made in two lengths, 8 and 12 inches. Toolmakers will find the small size more desirable for general use, and the larger one for heavier work. For pattern makers a knife scriber, made of a fine grade of steel, is supplied as an auxiliary. Prices are for either 8 or 12-inch points.

NO. 68	Each
Without Knife Point	$0.60
Knife Points	.20
Scriber Points	.20

8-inch size, without knife point, sent unless otherwise ordered.

POCKET SCRIBERS

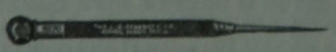


Fig. 785

Reversible, telescoping into the stock, and is held by a slight turn of chuck.

NOS.	70A	70B
Diameter Handle, Inches	1/4	3/8
Length of Blade, Inches	2 3/8	2 7/8
Each	$0.30	.45

All Scribers, Six in a Box

SCRATCH GAUGES

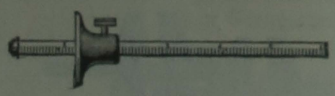


Fig. 786

For scribing lines parallel to a given surface; made of steel with a hardened cast steel head; beam is gripped by a split bushing when set screw is tightened; marker is a square piece of thin steel nicely tempered, presenting four marking points. Graduated in 50ths or 64ths of an inch. Two extra cutters sent with each gauge.

NO. 29

Length, Inches	5	6
Weight Each, Ounces	2	4
Each, Plain	$0.80	.90
Each, Graduated	$1.20	1.50

Sent graduated in 64ths unless otherwise ordered.

UNIVERSAL SURFACE GAUGES

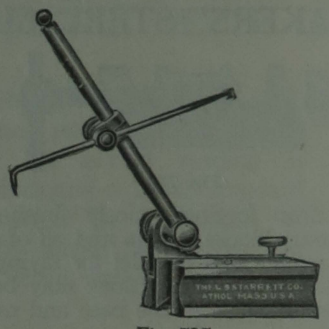


Fig. 787

TOOLMAKERS'

Admirably adapted for light work. The base is steel, nicely finished and case-hardened, with depressions milled in the sides for the thumb and finger to grasp. A V-shaped groove in the bottom adapts it for use on cylindrical work. An auxiliary guide piece is furnished to clamp to the base. Spindle 4 inches long.

	Each
NO. 56A—With Auxiliary Guide	$4.10
NO 56B—Without Auxiliary Guide	3.50

A 7-inch spindle can be furnished at an extra cost of $0.25.

One in a Box

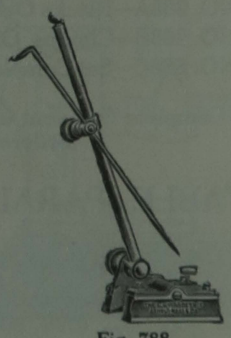


Fig. 788

Heavy base, grooved through bottom and end, adapting it for use against cylindrical work as well as flat surfaces. Two gauge pins in rear of base which may be pushed down to bear against edge of surface plate or in the slot of a planer bed for linear work. Spindle passes through a rotating head, jointed to a rocking bracket, pivoted in the base. For small work the spindle may be removed and the scriber inserted in the hole provided.

NOS.	57A	57B	57C	57D
Size Base, Inches	3	3	3 3/4	3 3/4
Length Spindles, Inches	9	9 and 12	12	12 and 18
Each	$3.50	4.00	4.15	4.75

All Above, One in a Box

SURFACE GAUGES

UNIVERSAL

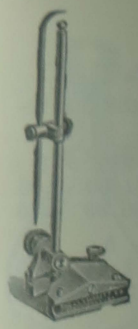


Fig. 789

Heavy case-hardened steel base, grooved through bottom and end, adapting it for use against cylindrical work as well as flat surfaces. The spindle passes through a rotating head, jointed to a rocking bracket, pivoted in base, and may be set upright or at any angle or turned so as to work under base. In the base are 4 gauge pins which may be pushed down to bear against the edge of a surface plate or in the slot of a planer bed for linear work. These pins also adapt the gauge for use as a locomotive guide.

NOS	257A	257B	257C	257D
Size Base, Inches	3	3	3½	3½
Length Spindles, Ins.	9	9 and 12	12	12 and 18
Each	$4.75	5.15	5.30	6.30

MICROMETER TYPE

Turned and polished base; micrometer adjusting nut reading to $\frac{1}{1000}$ of an inch; 6-inch extension for the spindle; springs and taper fittings hold the spindle by a slight friction while adjustments are made and a knurled cam on the base locks the spindle after the adjustments are made.

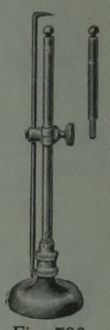


Fig. 790

NOS	53A	53B	*53C
Length, Inches	8	12	12
Each	$3.00	4.20	4.80

*No. 53C includes the 6-inch extension; the other numbers do not have it.

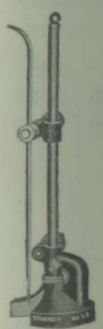


Fig. 791

The sleeve and needle clasp, when loosened for adjustment, are both held by a slight spring friction and by a single knurled nut; both are rigidly clamped. For fine adjustment, the spindle is raised or lowered by a knurled nut and all backlash is taken up by a spiral spring in the base.

NOS	52A	52B	*52C
Length, Inches	8	12	12
Each	$2.40	3.30	3.90

*No. 52C has a 6-inch extension.

SURFACE GAUGE ATTACHMENTS

Fig. 792

For use between the centers of a lathe to adjust, locate and lay out work secured to the face plate. The sleeve of No. 53 Surface Gauge fits the auxiliary arbor.

	Each
NO. 54—Attachment Complete, 12-Inch	$1.80
Auxiliary Arbor only;	.60

All Above, One in a Box

DIVIDERS

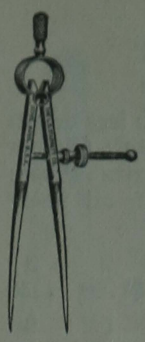


Fig. 793

TOOL MAKERS

Made from round stock with legs drawn down making them hard and stiff. The fulcrum stud is hardened, bows are made extra strong, screw and nut nicely fitted. Finely finished. Made with solid nut only.

NO. 277

Size, Inches	2	3	4	5	6
Each	$1.20	1.50	1.80	1.80	2.10

STARRETTS

Made of the best steel, finely finished; with squared shank and legs; fulcrum stud is hardened; strong spring bow; furnished with either solid or spring adjusting nut.

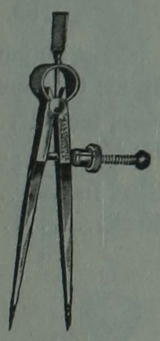


Fig. 794

NO. 77

Size, Inches	2½	3	4	5	6	8
Spring Nut, Each	$1.40	1.40	1.70	1.70	2.10	2.40
Solid Nut, Each	1.20	1.20	1.50	1.50	1.95	2.25

Sent with spring nut unless otherwise ordered.

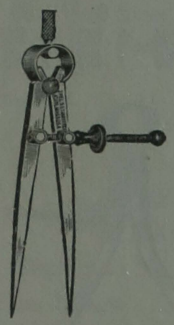


Fig. 795

YANKEE

Made of best steel finely finished. Can be furnished with spring or solid nut as desired.

NO. 83

Size, Inches	2½	3	4	5	6
Spring Nut, Each	$1.00	1.05	$1.10	1.15	1.20
Solid Nut, Each	.80	.85	.90	1.00	1.05

Size, Inches	8	10	12
Spring Nut, Each	$1.50	1.80	2.00
Solid Nut, Each	1.35	1.65	1.80

Sent with solid nut unless otherwise ordered.

LOCK JOINT

Made of best tool steel finely tempered and finished. Has improved lock-joint attachment and sensitive adjustment. It is light and stiff with large capacity, instantly opened, closed and locked.

Fig. 796

NO. 43

Size, Inches	6	8	10
Each	$1.20	1.50	1.80

CALIPERS

STARRETT

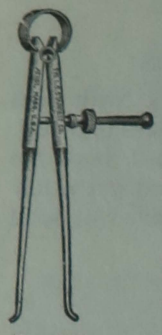


Fig. 797

TOOLMAKERS'

NO. 274—Inside

Made from round stock with legs drawn down, making them hard and stiff; fulcrum stud is hardened; bow is extra strong; screw and nut nicely fitted; all finely finished. Solid nut only.

Size, Inches	2	3
Each	$1.20	1.50

Size, Inches	4	5	6
Each	$1.80	1.80	2.10

TOOLMAKERS'

NO. 275—Outside

Construction the same as No. 274—Inside Calipers. Solid nut only.

Size, Inches	2	3
Each	$1.20	1.50

Size, Inches	4	5	6
Each	$1.80	1.80	2.10

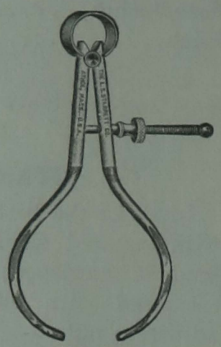


Fig. 798

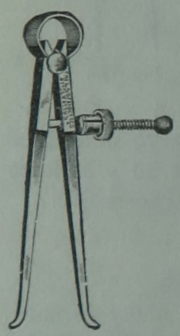


Fig. 799

FAY

NO. 74—Inside

Squared stock and legs; finely finished. Furnished with either solid nut or with quick-adjusting spring nut.

Size, Inches	2½	3	4
Each, Spring Nut	$1.40	1.40	1.50
Each, Solid Nut	$1.20	1.20	1.35

Size, Inches	5	6	8
Each, Spring Nut	$1.50	1.80	2.10
Each, Solid Nut	$1.35	1.65	1.95

FAY

NO. 75—Outside

Same construction as No. 74—Inside Calipers. With either solid nut or quick-adjusting spring nut.

Size, Inches	2½	3	4
Each, Spring Nut	$1.40	1.40	1.50
Each, Solid Nut	$1.20	1.20	1.35

Size, Inches	5	6	8
Each, Spring Nut	$1.50	1.80	2.10
Each, Solid Nut	$1.35	1.65	1.95

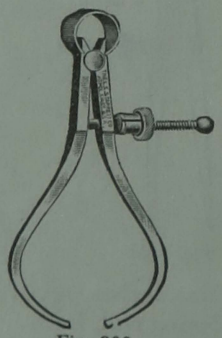


Fig. 800

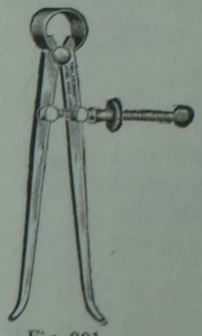


Fig. 801

YANKEE

NO. 73—Inside

Made of flat stock, light but reliable. Solid or spring nut.

Size, Inches	2½	3
Each, Spring Nut	$1.00	1.05
Each, Solid Nut	$0.80	.85

Size, Inches	4	5	6
Each, Spring Nut	$1.10	1.15	1.20
Each, Solid Nut	$0.90	1.00	1.05

Size, Inches	8	10	12
Each, Spring Nut	$1.40	1.80	2.00
Each, Solid Nut	$1.20	1.65	1.80

CALIPERS

STARRETT

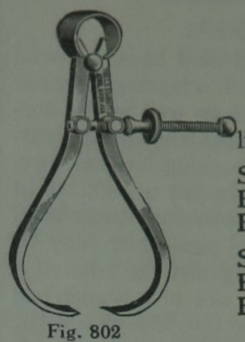


Fig. 802

YANKEE

NO. 79—Outside

Made of flat stock; light but reliable; solid or spring nut.

Size, Inches	2½	3
Each, Spring Nut	$1.00	1.05
Each, Solid Nut	$0.80	.85

Size, Inches	4	5	6
Each, Spring Nut	$1.10	1.15	1.20
Each, Solid Nut	$0.90	1.00	1.05

Size, Inches	8	10	12
Each, Spring Nut	$1.40	1.80	2.00
Each, Solid Nut	$1.20	1.65	1.80

YANKEE

NO. 81—Inside

Similar to No. 73 but with solid nut only.

Size, Inches	4	5	6
Each	$0.90	1.00	1.05

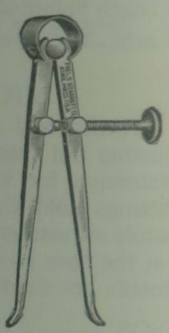


Fig. 803

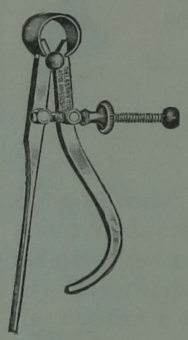


Fig. 804

NO. 82—Keyhole

Made of flat stock, similar in construction to No. 81, with solid or spring nut.

Size, Inches	3	4
Each, Solid Nut	$0.85	1.05
Each, Spring Nut	$0.90	1.10

NO. 80—Outside Thread

Made of flat stock, with solid or spring nut.

Size, Inches	3	4	5
Each, Solid Nut	$1.05	1.10	1.15
Each, Spring Nut	$1.20	1.30	1.35

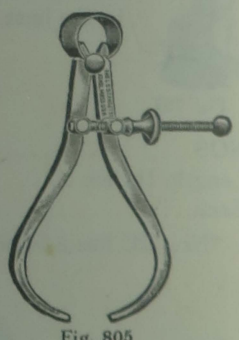


Fig. 805

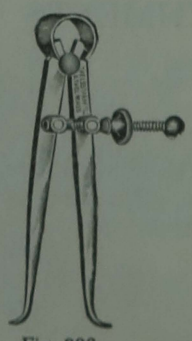


Fig. 806

NO. 184—Inside Thread

Made of flat stock, solid or spring nut. These calipers are designed for measuring the diameter at bottom of threads.

Size, Inches	4	5	6
Each, Spring Nut	$1.10	1.15	1.20
Each, Solid Nut	$1.15	1.00	1.05

CALIPERS

STARRETT

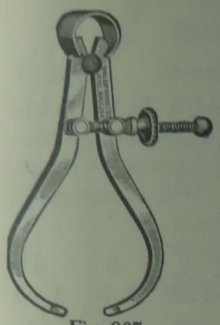


Fig. 807

NO. 179—Outside Thread

Made of flat stock; solid or spring nut. Designed for measuring the diameter at bottom of threads on the outside of screws.

Size, Inches	4	5	6
Each, Spring Nut	$1.10	1.15	1.20
Each, Solid Nut	$0.90	1.00	1.05

IMPROVED

NO. 26—Outside

Made of flat stock, finely finished; has improved joint. The main stud is squared and fitted to one leg, preventing the stud from turning when loosening and tightening. The capacity is about one-third greater than the size given.

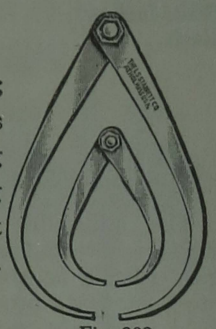


Fig. 808

Size, Inches	3	4	5
Each	$0.50	.60	.70

Size, Inches	6	8	10	12	14
Each	$0.80	1.00	1.10	1.20	1.80

Size, Inches	16	18	20	24	30	36
Each	$2.10	2.55	3.00	3.60	6.00	7.20

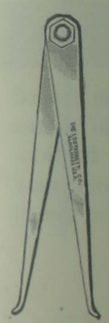


Fig 809

NO. 27—Inside

Similar in construction to No. 26, but not made larger than 24 inches. Capacity is about one-third greater than the size given.

Size, Inches	3	4	5	6
Each	$0.50	.60	.70	.80

Size, Inches	8	10	12	14
Each	$1.00	1.10	1.20	1.80

Size, Inches	16	18	20	24
Each	$2.10	2.55	2.50	3.00

NO. 34—Screw Adjusting, Outside

Made of flat stock, finely finished. Has screw adjustment for fine measurements; improved joint which may be set to any degree of tension.

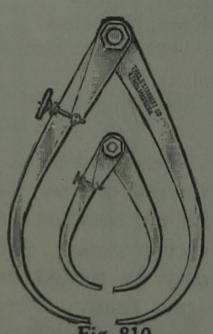


Fig. 810

Size, Inches	4	6
Each	$0.90	1.00

Size, Inches	8	10	12	14	16
Each	$1.25	1.50	1.75	2.00	2.25

Size, Inches	18	20	24	30	36
Each	$2.50	2.75	3.50	6.00	7.00

CALIPERS

STARRETT

Fig. 811

NO. 35—Screw Adjusting, Inside

Similar in construction to No. 34, but not made larger than 24 inches.

Size, Inches	4	6	8
Each	$1.10	1.20	1.50

Size, Inches	10	12	14
Each	$1.80	2.10	2.40

Size, Inches	16	18	20	24
Each	$2.70	3.00	3.30	4.20

DOUBLE CALIPERS

NO. 44

Made of best steel, finely finished. Combine dividers and inside and outside calipers; has improved firm friction joints.

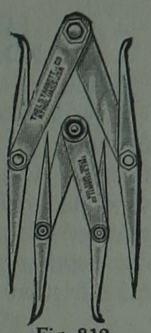


Fig 812

Size, Inches	6	8
Each	$1.50	1.80

Fig. 813

HERMAPHRODITE

NO. 41—Firm Joint

Made of flat stock, finely finished; has adjustable point and improved firm joint.

Size, Inches	4	6
Each	$0.80	1.00

Size, Inches	8	10
Each	$1.20	1.45

HERMAPHRODITE

NO. 42—Lock Joint

Similar to No. 41, but has lock joint.

Fig 814

Size, Inches	4	6
Each	$1.20	1.40

Size, Inches	8	10
Each	$1.65	1.95

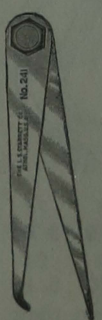


Fig 815

HERMAPHRODITE

NO. 241—Solid Point

The same as No. 41, except that both points are solid.

Size, Inches	3	4	5
Each	$0.50	.60	.70

Size, Inches	6	8	10	12
Each	$0.80	1.00	1.10	1.20

CALIPERS

STARRETT

Fig. 816

HERMAPHRODITE

NO. 242—Solid Point

The same as No. 42, except that both points are solid.

Size, Inches	4	6
Each	$1.10	1.20
Size, Inches	**8**	**10**
Each	**$1.50**	**1.80**

LOCK JOINT

NO. 38—Outside

Made of steel, nicely finished. Has wide scope that can be adjusted instantly to full extent and locked firmly. Has sensitive adjustment; tapering socket joint; locked and released by partial turn of knurled disc; spring washer under disc maintains friction in joint when unlocked.

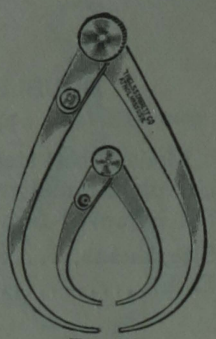


Fig. 817

Size, Inches	4	5	6	
Each	$1.10	1.15	1.20	
Size, Inches	**8**	**10**	**12**	**14**
Each	**$1.50**	**1.80**	**2.10**	**2.40**
Size, Inches	**16**	**18**	**20**	**24**
Each	**$2.70**	**3.00**	**3.30**	**4.20**

LOCK JOINT

NO. 39—Inside

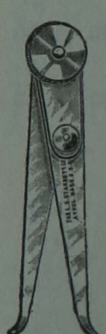


Fig. 818

Similar in construction to No. 38.

Size, Inches	4	5	6	
Each	$1.10	1.15	1.50	
Size, Inches	**8**	**10**	**12**	**14**
Each	**$1.50**	**1.80**	**2.10**	**2.40**
Size, Inches	**16**	**18**	**20**	**24**
Each	**$2.70**	**3.00**	**3.30**	**4.20**

LOCK JOINT TRANSFER

NO. 36—Outside

Has all the features of No. 38, but in addition may be used over flanges, etc., removed and replaced without losing the size calipered.

Fig. 819

Size, Inches	4	5	6	
Each	$1.50	1.70	1.80	
Size, Inches	**8**	**10**	**12**	**14**
Each	**$2.10**	**2.40**	**2.70**	**3.00**
Size, Inches	**16**	**18**	**20**	**24**
Each	**$3.30**	**3.60**	**4.20**	**5.10**

Will caliper a cylinder 20 per cent. larger than their length.

CALIPERS

STARRETT

Fig. 820

LOCK JOINT TRANSFER

NO. 37—Inside

Similar in construction to No. 39, but in addition may be used inside of chambered cavities, etc., removed and replaced without losing the size calipered. Will open nearly twice their length.

Size, Inches	4	5	6	
Each	$1.50	1.70	1.80	
Size, Inches	**8**	**10**	**12**	**14**
Each	**$2.10**	**2.40**	**2.70**	**3.00**
Size, Inches	**16**	**18**	**20**	**24**
Each	**$3.30**	**3.60**	**4.20**	**5.10**

DIVIDERS

STARRETT

UNIVERSAL

The adjustable scriber holder is reversible and carries either a fine tempered steel point or a pencil lead, held in a split socket by knurled nut. May be made to work close to shoulders and will scribe the smallest circle.

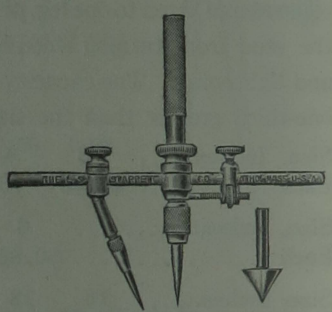


Fig. 821

	Each
NO. 89—With 4-Inch Beam and V Center Point...	$2.00

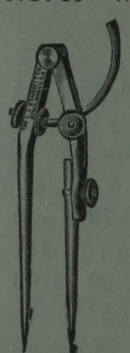


Fig. 822

NO. 92—Improved

Both points are made of crucible forged steel, nicely tempered. The quadrant passes through the leg and the clamp screw frictionally locks it firm. The adjustable point may be removed instantly and a common pencil inserted.

Size, Inches	6	7	8	9
Each, Plain	$1.35	1.40	1.50	1.65
Each, Nickeled	$1.65	1.70	1.80	1.95

Sent plain unless otherwise ordered.

NO. 85—Extension

Head and arms made of malleable iron, the rest of steel; nicely finished. Has locking nut between arms against which a spiral spring works. After fine adjustment nut may be turned back, locking spring and arms firmly. Furnished with inside and outside caliper legs.

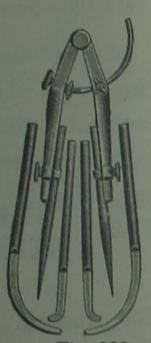


Fig. 823

Size, Inches	7	9	12
Each, with Divider Legs only	$1.80	2.10	3.00
Each, Complete	$3.00	3.30	4.20

WING DIVIDERS

Fig. 824

Made of forged steel well polished; joints are of brass.

NO. 35

Length, Inches	5	6			
Weight per Dozen, Lbs.	2	4			
Per Dozen	$5.50	5.50			
Length, Inches	7	8	9		
Weight per Dozen, Lbs.	4¼	4½	7		
Per Dozen	$6.50	7.50	9.00		
Length, Inches	10	12	15	18	24
Weight per Dozen, Lbs.	8	12	14	19½	34½
Per Dozen	$10.00	12.00	28.00	39.00	56.00

TRAMMEL POINTS

NO. 50—Made of bronze metal with forged steel points, hardened; nickel plated. Either point can be removed and the pencil socket supplied with each pair can be put in its place. Adjustable like spring dividers.

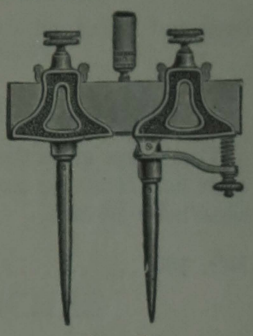


Fig. 825

With 3-Inch Points

	Each
NO. 50A—Adjustable	$3.00
NO. 50B—Not Adjustable	1.80

EXTENSION BEAM TRAMMELS

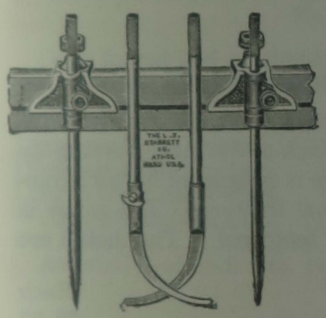


Fig. 826

NO. 51—Nickel Plated. Has opening thru underside to accommodate the extension giving width and stiffness in proportion to the length required for large work. It is equally well adapted to receive a narrow beam for light work. Points are eccentric to provide for fine adjustments.

	Each
NO. 51A—Without Caliper Legs	$3.90
NO. 51B—Complete	3.00

NO. 58—Steel Beam

Beam 5/16-inch round, flat on one side; made in 14-inch sections and coupled together. Slides grip beam and points by turn of knurled nut.

Nos. A, B and C are Plain.
Nos. D, E and F are Nickel Plated.

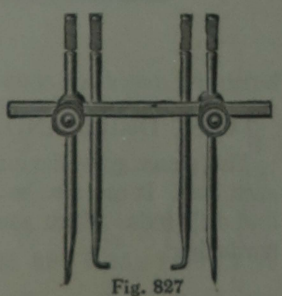


Fig. 827

NOS.	58A	58B	58C	58D	58E	58F
Size, Inches	14	28	42	14	28	42
Sections	1	2	3	1	2	3
Each	$2.65	3.15	3.60	3.00	3.60	4.20
Extra Sections, Each	$0.60	.60	.60	.75	.75	.75
Caliper Pts., per pair	$0.60	.60	.60	.75	.75	.75

Those not nickeled will be sent unless otherwise ordered.

TRAMMELS

STARRETTS

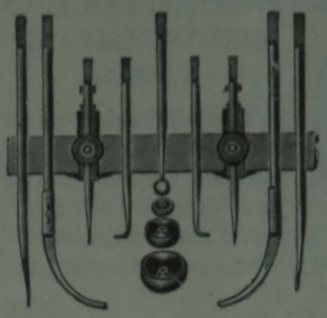


Fig. 828

NO. 59—New

May be fastened to wooden beam ¾ to 1⅝ inches wide and of any thickness desired. Furnished with inside and outside caliper legs; extra pair of long points; a set of four ball points with holder. Lead pencil may be used instead of steel points.

	Each
NO. 59A—Trammel Heads (with one pair of points,)	$2.40
NO. 59B—Balls and Holder, Per Set	1.50
NO. 59C—Small Caliper Legs, per Pair	0.60
NO. 59D—Large Caliper Legs, per Pair	0.90
NO. 59E—Large Divider Points, per Pair	0.60
NO. 59F—Set Complete	5.70

No. 59A will be sent unless otherwise ordered.

WIRE GAUGES

AMERICAN STANDARD

Each gauge is tested after hardening and warranted accurate. The decimal equivalents of each number are stamped on the back.

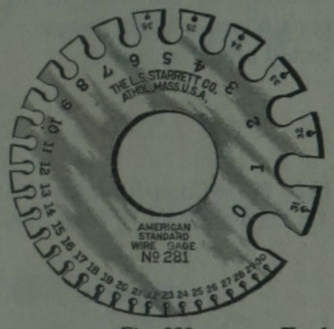


Fig. 829

	Each
NO. 281—Capacity No. 0 to No. 36	$3.00

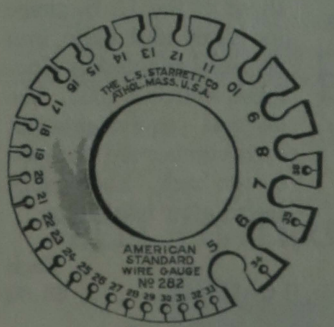


Fig 830

Each gauge is tested after hardening and warranted accurate. The decimal equivalents of each number are stamped on the back.

	Each
NO. 282—Capacity. From No. 5 to No. 36	$2.50

STANDARD MUSIC WIRE

Washburn and Moen Standard. Each gauge carefully tested after hardening.

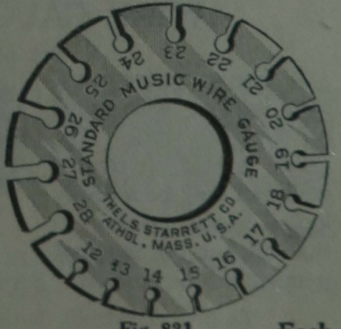


Fig. 831

	Each
NO. 280—Capacity, from No. 12 to No. 28	$1.80

WIRE GAUGES

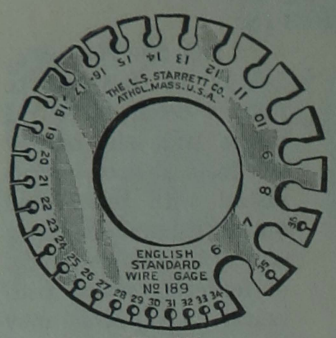


Fig. 832

ENGLISH STANDARD BIRMINGHAM AND STUBBS

The decimal equivalents of each number are stamped on the back of each gauge. Each gauge tested after hardening.

	Each
NO. 188—Capacity from No. 1 to No. 36	$3.00
NO. 189—Capacity from No. 6 to No. 36	2.50

WASHBURN AND MOEN

The decimal equivalents of each number are stamped on the back of each gauge. Each gauge tested after hardening.

Fig. 833

	Each
NO. 287—Capacity from No. 0 to No. 36; 3¼ Inches in diameter, ⅛ Inch thick	$3.00

Fig. 834

UNITED STATES

The gauge numbers are those of the U. S. gauge for sheet and plate iron and steel adopted by Congress, March 3, 1893. The decimal equivalents of each number are stamped on the back. Each gauge tested after hardening.

	Each
NO. 283—Capacity from No. 0 to No. 36	$3.00

WIRE GAUGE GUIDE

A time saver for workmen using a wire gauge on duplicate work. The gauge is held on central stud and may be securely locked in any position so that all but the required number will be covered. For all standard wire gauges.

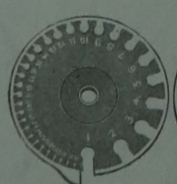


Fig. 835

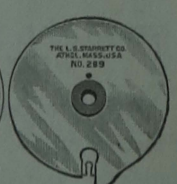


Fig. 836

	Each
NO. 288	$0.80

TAP AND DRILL GAUGES

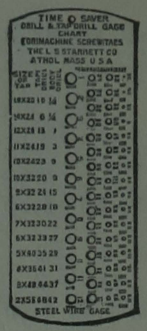


Fig. 837

TIME SAVER

This gauge enables one to select quickly the right sized drill to suit machine screw tap most commonly used, leaving just enough stock for the tap to cut as near a full thread as is practicable for one tap without breaking it.

	Each
NO. 185	$2.40

DRILL AND STEEL WIRE

This gauge gives the number of drill to fit each hole, and the size of the hole in thousandths of an inch.

	Each
NO. 186	$2.00

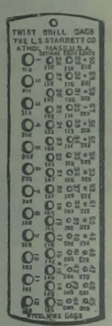


Fig. 838

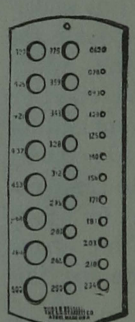


Fig. 839

JOBBERS' DRILL

For gauging twist drills. This gauge shows sizes from 1/16 Inch to ½ Inch, varying by 64ths. Each size is designated by both common and decimal fractions. The gauge is hardened and tempered. The holes are standard.

	Each
NO. 187	$2.75

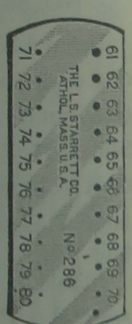


Fig. 840

TWIST DRILL AND STEEL WIRE

This gauge gives the number of drill to fit each hole. It can also be used in measuring fine drill rods. Each gauge is tested after hardening.

	Each
NO. 286—Capacity, No. 61 to No. 80, Inclusive, Length, 2 Inches; Width, ¾ Inch; Thickness, 1/16 Inch	$2.40

KNURLED PIN PUNCHES

Fig. 841

Blued crucible steel; knurled handle, 5/16 inches diameter.

NO. 12

Size Point, Inches	3/32	1/8	3/32
Length Over All, Inches	4 1/4	4 1/4	4 1/4
Weight per Dozen, Lbs.	3 1/4	3 1/4	3 1/2
Per Dozen	$1.50	1.50	1.50

PRICK PUNCHES

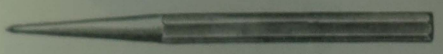


Fig. 842

Drop forged and machined; points hardened, tempered and polished; black finish, octagon body.

NOS.	10	12
Diameter Point, Inches	1/16	5/64
Diameter Body, Inches	5/16	3/8
Length Over All, Inches	4 1/2	4 3/4
Weight per Dozen, Lbs.	1 1/8	1 3/4
Per Dozen	$1.35	1.75

CENTER PUNCHES

Fig. 843

Drop forged and machined; points hardened, tempered and polished; black finish, octagon body.

NOS.	8	10	12
Diameter Point, Inches	5/32	3/16	7/32
Diameter Body, Inches	1/4	5/16	3/8
Length Over All, Inches	4	4	4
Weight per Dozen, Lbs.	7/8	1	1 3/8
Per Dozen	$1.00	1.35	1.75

Assorted 4 of each size, per dozen, $1.40.

RIVET PUNCHES

Fig. 844

Drop forged and machined; ends hardened, tempered and polished. Black finish, octagon body.

NOS.	3	4	5	6
Diameter Point, Inches	3/32	1/8	5/32	3/16
Diameter Body, Inches	1/4	5/16	5/16	3/8
Length Over All, Inches	4	4 1/4	4 1/2	4 3/4
Weight per Dozen, Lbs.	5/8	1 1/8	1 1/4	1 1/2
Per Dozen	$1.00	1.35	1.50	1.75

NOS.	7	8	9	10
Diameter Point, Inches	7/32	1/4	9/32	5/16
Diameter Body, Inches	3/8	7/16	1/2	1/2
Length Over All, Inches	5	5 1/4	5 1/2	5 3/4
Weight per Dozen, Lbs.	2	2 3/4	3 3/4	4
Per Dozen	$2.00	2.50	3.25	3.50

All Above, One Dozen in a Box

CENTER PUNCHES

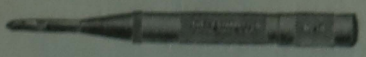


Fig. 845

AUTOMATIC

Automatically strikes a blow of the required force when the punch is in the exact position desired by the operator. It is provided with a knurled adjustable screw cap which in connection with a spring regulates the stroke. The working parts are hardened; the point can be removed for regrinding and easily replaced.

NOS.	18AA	18A	18B
Length, Inches	3 3/4	5	6
Diameter, Inches	3/8	1/2	5/8
Weight Each, Ounces	1	3	4
Each	$1.80	2.40	3.00
Extra Points, Each	$0.20	.20	.20

Length figured at medium stroke.

Each in a Box

Fig. 846

MECHANICS'

Made of fine steel, neatly shaped; both ends tempered and points nicely ground.

NO. 117

Sizes	A	B	C	D	E
Length, Inches	4	4	4	4	5
Diameter, Inches	5/64	3/32	7/64	5/32	1/4
Each	$0.25	.25	.25	.25	.30

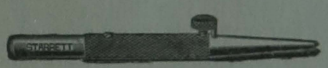


Fig. 847

SPACING

Made from best tool steel properly tempered. The screw with check nut sets the spacer right for small or large drills and has a variation from 5/64 to 3/8 inch.

	Each
NO. 118	$0.90

BELL CENTERING PUNCHES

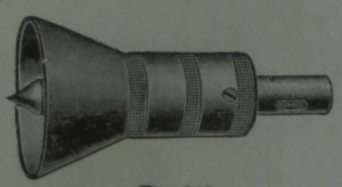


Fig. 848

Of finest tool steel. Used to mark center of round iron or shafting so that it may be placed between lathe centers correctly. The stem is struck when rod fits its size in cap which causes the center punch to mark the rod and indicate the exact center.

	Per Dozen
NO. 1—Centers shaft up to 1 3/8-Inch diameter; Weight per Dozen, 4 1/2 Lbs.	$7.20
NO. 2—Centers shaft to 2-Inch diameter; Weight per Dozen, 5 1/2 Lbs.	18.00

COMBINATION GAUGE BLOCKS

JOHANSSON

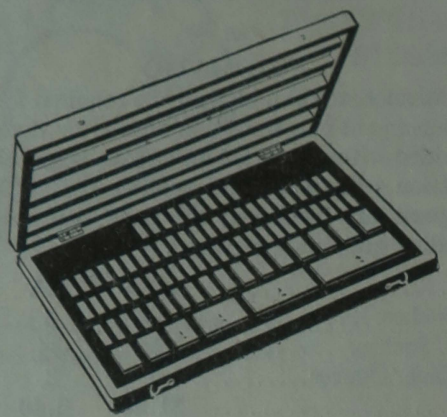


Fig. 849

SET NO. 1

Made of Swedish tool steel, hardened, ground and lapped. They are recognized as standard in practically all tool rooms and inspection departments. They are positive in results, sure and dependable. Being simply solid blocks of hardened steel they are nonadjustable, but used collectively, they become the most flexible precision tools imaginable, giving all sizes within their range to .0001 inch or less. The character of the flat surfaces is such that if they are cleaned of excess oil and dirt, two or more blocks may be slid together, adhering in a most remarkable manner and forming practically one solid piece of steel. They will remain in adhesion until wrung apart. As combinations in tenths of thousandths of an inch or five one-thousandths of a millimeter, may be made up at will, these gauge blocks are an accurate way to establish and maintain the limit gauges used in the limit system. These gauges can be used to lay out and check every kind of precision tool such as dies, jigs, fixtures and all kinds of shop and reference gauges. Guaranteed accuracy, .00001 inch at 68 degrees F.

These gauge blocks are invaluable as reference standards for establishing and maintaining all important dimensions. Eliminate need for master gauges to check shop and inspection gauges, as they are themselves master gauges and of such a form that they do not become obsolete when changes in design and dimension take place.

Contains 81 blocks; English or metric system of measuring. Hundreds of thousands of combinations can be formed with this set. Furnished complete with jaws, scriber, center point straight edge, holders and base.

Blocks are assorted as follows:

First Series, Inches

.1001	.1004	.1007
.1002	.1005	.1008
.1003	.1006	.1009

Second Series, Inches

.101	.108	.115	.122	.129	.136	.143
.102	.109	.116	.123	.130	.137	.144
.103	.110	.117	.124	.131	.138	.145
.104	.111	.118	.125	.132	.139	.146
.105	.112	.119	.126	.133	.140	.147
.106	.113	.120	.127	.134	.141	.148
.107	.114	.121	.128	.135	.142	.149

Third Series, Inches

.050	.400	.800	.350	.750
.100	.500	.900	.450	.850
.200	.600	.150	.550	.950
.300	.700	.250	.650	

Fourth Series, Inches 1, 2, 3 and 4.

Price on Application

ADJUSTABLE LIMIT SNAP GAUGES

JOHANSSON

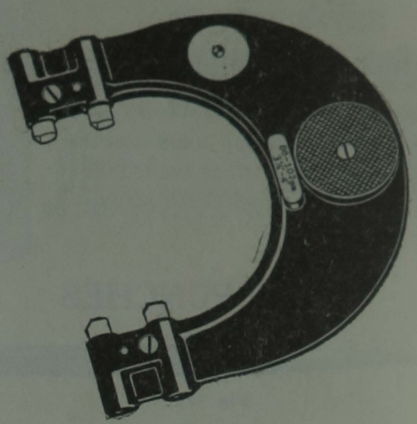


Fig. 850

MODEL A

Made of Swedish grey iron with plugs of Swedish tool steel. The frame will not warp, bend, nor spring. Each frame is equipped with an aluminum tag for marking working limits and other data. The plugs are hardened and ground to a snug, sliding fit in the frame. Have extra large flat contact faces, lapped parallel to each other. The edge coming in contact with work is beveled and aids the operator in guiding the gauge squarely on the work. Plugs are not threaded and do not turn in the frame. Have end movement only and cannot become cocked or pitched. When worn, can be reground and set to size at small cost. The adjusting screws have fine threads for accurate adjustment and may be sealed with wax to prevent anyone from tampering with adjustment.

The clamping screws have tapered heads bearing upon the flat of the gauging plugs thus holding them securely.

The insulated grip is of pressed steel. The two halves of the grip do not come into contact with frame, being separated from it by two fibre washers having knurled surfaces offering a sure grip.

These gauges have wide range and are adjustable wear, changing limits and different sizes.

NOS.	Range of Sizes Inches	Millimeters	Weight Each, Lbs.	Each
0	0 – ¼	0–6	5/16	$9.50
1	¼ – ½	6–13	5/16	10.00
2	½ – ¾	12–20	6/16	10.50
3	¾ – 1	18–26	7/16	11.00
4	1 – 1¼	24–32	7/16	11.50
5	1¼ – 1½	31–39	8/16	12.50
6	1½ – 2	37–51	14/16	14.00
7	2 – 2½	50–64	1	15.00
8	2½ – 3	63–77	1 5/16	16.00
9	3 – 3½	75–89	1 9/16	17.00
10	3½ – 4	88–102	1 5/16	18.00
11	4 – 4½	100–115	2 3/16	19.50
12	4½ – 5	113–128	2 3/16	21.00
13	5 – 5½	125–140	2 19/16	22.50
14	5½ – 6	138–153	2 13/16	24.00
15	6 – 7	150–180	4 4/16	25.50
16	7 – 8	175–205	4 13/16	27.00
17	8 – 9	200–230	5 4/16	28.50
18	9 –10	225–255	6	30.00
19	10 –11	250–280	6 13/16	31.50
20	11 –12	275–305	7	33.00

STANDARD THREAD GAUGES

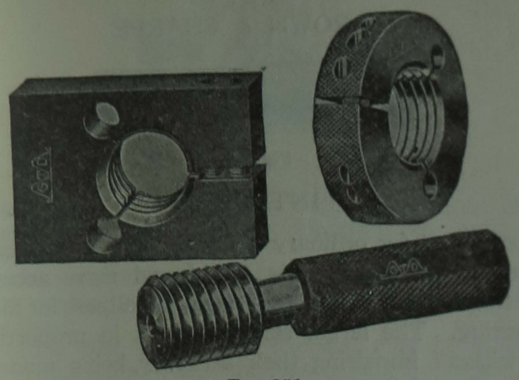


Fig. 851

These gauges are made with a one-eighth flat at top of thread, and a sharp V bottom, differing from the U. S. form of thread which has a flat at both top and bottom. This improvement enables gauge to clear fine chips, dust and dirt which may have lodged in threads being tested. Templets are adjustable by means of interlocking set screws.

U. S. STANDARD

Size, Inches	Threads Per Inch	Diameter Basic Pitch	Per Set	Plugs, Each	Templets, Each
1/4	20	.218	$10.60	$5.30	$5.30
5/16	18	.276	10.60	5.30	5.30
3/8	16	.334	11.20	5.60	5.60
7/16	14	.391	11.20	5.60	5.60
1/2	13	.450	11.80	5.90	5.90
9/16	12	.508	13.20	6.60	6.60
5/8	11	.566	13.20	6.60	6.60
11/16	11	.629	14.60	7.30	7.30
3/4	10	.685	14.60	7.30	7.30
13/16	10	.748	16.00	8.00	8.00
7/8	9	.803	16.00	8.00	8.00
15/16	9	.865	17.40	8.70	8.70
1	8	.919	17.40	8.70	8.70
1 1/8	7	1.032	19.00	9.50	9.50
1 1/4	7	1.157	20.40	10.20	10.20
1 3/8	6	1.267	22.00	11.00	11.00
1 1/2	6	1.392	23.00	11.50	11.50
1 5/8	5 1/2	1.507	24.40	12.20	12.20
1 3/4	5	1.620	25.80	12.90	12.90
1 7/8	5	1.745	27.40	13.70	13.70
2	4 1/2	1.856	29.30	14.65	14.65

S.A.E STANDARD

Size Inches	Threads Per Inch	Diameter Basic Pitch	Per Set	Plugs, Each	Templets, Each
1/4	28	.227	$10.60	$5.30	$5.30
5/16	24	.285	10.60	5.30	5.30
3/8	24	.348	11.20	5.60	5.60
7/16	20	.405	11.20	5.60	5.60
1/2	20	.468	11.80	5.90	5.90
9/16	18	.526	13.20	6.60	6.60
5/8	18	.589	13.20	6.60	6.60
11/16	16	.647	14.60	7.30	7.30
3/4	16	.709	14.60	7.30	7.30
7/8	14	.829	16.00	8.00	8.00
7/8	18	.839	16.00	8.00	8.00
1	14	.954	17.40	8.70	8.70
1 1/8	12	1.071	19.00	9.50	9.50
1 1/4	12	1.196	20.40	10.20	10.20
1 3/8	12	1.321	22.00	11.00	11.00
1 1/2	12	1.446	23.00	11.50	11.50

Templet No. 1503. Templet No. 1504. † Spark Plug thread. Left hand threads are special. One plug, one templet to a set.

SIZE BLOCKS

LOWAY

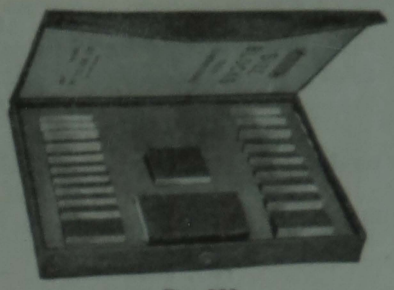


Fig. 852

Made from carefully selected material, heat treated and hardened, ground and lapped. For use of all mechanics. No calculations are necessary in using the instruments.

	Per Set
Set A—Combines Sets B and C—Twenty-one Blocks, Including 1 and 2-Inch Blocks; Total Measurement Over All, 6.293 Inches	$24.50
Set B—Consists of Thirteen Blocks in Fractional Denominations, by 64ths to a Total of 4 1/32 Inches	15.75
Set C—Consists of Eleven Blocks in Decimal Denominations from .025 to a Total of 4.825 Inches	15.75
Set M—Consists of Fifteen Blocks, Reading in .1 m/m from .4 m/m up to 50 m/m	23.00

SINE BARS

LOWAY

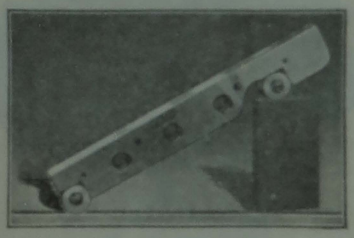


Fig. 853

Used in connection with size blocks in setting up angles. All angles read direct from accompanying table. Each NO. S81 $12.00

CAST IRON STRAIGHT EDGES

Fig. 854

Of a form best adapted to retain a straight line. The edge of each is scraped to form a true surface. Indispensable in proper scraping of the ways of planer and lathe beds. Price includes cover.

Size Inches	Weight Each, Lbs.	Each	Size Inches	Weight Each, Lbs.	Each
18x1 1/2	5	$10.50	72x2 1/4	75	$48.00
24x1 5/8	10	14.00	84x2 5/16	120	53.00
30x1 3/4	15	17.50	96x2 3/8	145	57.00
36x1 7/8	15	22.00	120x2 3/4	300	73.00
48x2	35	30.00	144x3*	420	.....
60x2 1/8	50	39.00	180x3 1/2*	835	.....

*Made to order only. Prices upon application.

END MEASURING RODS

BROWN & SHARPE

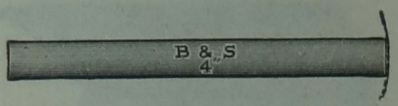


Fig. .855

Can be used for measuring rings, cylinders, parallel surfaces, etc., setting calipers or work of similar character. Made of steel, hardened on the ends and accurately ground.

NO. 655

WITH SPHERICAL ENDS

Length, Inches	Each	Length, Inches	Each
3	$1.75	10	$3.50
4	2.00	11	3.75
5	2.25	12	4.00
6	2.50	13	4.25
7	2.75	14	4.50
8	3.00	15	4.75
9	3.25	16	5.00

Rods from 3 to 6 inches are 3/8 inch in diameter; larger, 1/2 inch.

Intermediate sizes furnished at the price of the size next larger given in list.

CAST IRON SURFACE PLATES

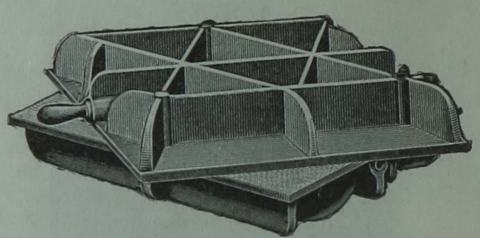


Fig. 856

Made of high grade cast iron. Are accurately surfaced. Price is for single plate with protective wood cover.

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
3 1/2 x 4	2	$4.25	12x18	58	$37.50
3 1/2 x 12	10	10.00	12x24	92	52.00
4 x 7	6	8.00	12x36	158	75.00
4 x15	17	13.50	*12x144	2000	292.00
4 x18	18	14.50	*12x65	390	139.00
*4 x40	80	27.50	14x14	52	32.00
4 1/2 x 6	5	7.75	14x18	58	42.00
5 x16	18	15.50	14x21	78	52.00
6 x 6	6	9.50	15x30	160	79.00
6 x12	15	14.50	16x16	66	42.00
6 x26	46	25.50	16x48	355	145.00
6 x50	105	54.00	18x18	90	54.00
*6 x72	280	75.00	18x24	120	73.00
6 1/2 x18	30	22.00	18x36	180	96.00
7 x 7 1/2	10	12.00	20x30	200	105.00
7 x10	15	14.50	24x24	205	99.00
8 x12	19	16.50	24x36	285	152.00
9 x 9	16	15.50	24x48	485	204.00
9 x14	29	20.50	24x60	696	264.00
10 x15	39	25.00	30x36	375	190.00
10 x30	86	53.00	30x60	800	328.00
10 x50	190	87.00	36x68	1355	464.00
12 x12	30	23.50			

*Made to order only.

CYLINDRICAL GAUGES

BROWN & SHARPE

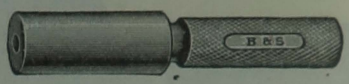


Fig. 857

INTERNAL

Convenient for ordinary machine work as calipers can be set and measurements transferred more accurately than from a rule; can be used without calipers for internal measuring. The larger sizes are light in proportion to size without impairing their accuracy, being made of a hardened steel ring on an aluminum center. Each gauge plainly stamped with its size in decimals and fractions. Made of tool steel carefully hardened and finely finished

NO. 660

Size, Inches	Each	Size, Inches	Each	Size, Inches	Each
1/8	$3.75	1 1/8	$5.40	2 1/8	$8.95
3/16	3.75	1 3/16	5.50	2 3/16	9.15
1/4	3.75	1 1/4	5.65	2 1/4	9.30
5/16	3.75	1 5/16	5.80	2 5/16	9.50
3/8	3.90	1 3/8	6.00	2 3/8	9.80
7/16	4.00	1 7/16	6.20	2 7/16	10.15
1/2	4.15	1 1/2	6.40	2 1/2	10.30
9/16	4.25	1 9/16	6.55	2 9/16	10.50
5/8	4.40	1 5/8	6.75	2 5/8	10.70
11/16	4.50	1 11/16	6.95	2 11/16	10.90
3/4	4.65	1 3/4	7.15	2 3/4	11.05
13/16	4.75	1 13/16	7.35	2 13/16	11.25
7/8	4.90	1 7/8	7.50	2 7/8	
15/16	5.00	1 15/16	7.70	2 15/16	11.65
1	5.15	2	7.90	3	11.80
1 1/16	5.25	2 1/16	8.75		

Fig. 858

EXTERNAL

For measuring shafts, spindles, etc.

NO. 662

Size, Inches	Each	Size, Inches	Each	Size, Inches	Each
1/8	$5.65	1 1/8	$8.45	2 1/8	$14.05
3/16	5.65	1 3/16	8.75	2 3/16	14.40
1/4	5.65	1 1/4	9.05	2 1/4	14.70
5/16	5.75	1 5/16	9.40	2 5/16	15.00
3/8	5.95	1 3/8	9.70	2 3/8	15.30
7/16	6.15	1 7/16	10.00	2 7/16	15.65
1/2	6.30	1 1/2	10.30	2 1/2	15.95
9/16	6.50	1 9/16	10.65	2 9/16	16.25
5/8	6.70	1 5/8	10.95	2 5/8	16.55
11/16	6.90	1 11/16	11.25	2 11/16	16.90
3/4	7.05	1 3/4	11.55	2 3/4	17.20
13/16	7.25	1 13/16	11.90	2 13/16	17.50
7/8	7.45	1 7/8	12.20	2 7/8	17.80
15/16	7.65	1 15/16	12.50	2 15/16	18.15
1	7.80	2	12.80	3	18.45
1 1/16	8.15	2 1/16	13.75		

SPEED INDICATORS

STARRETT

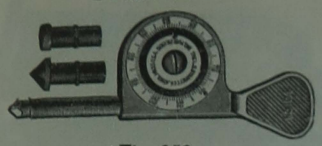


Fig. 859

Frictionless bearing against which the inner end of the spindle revolves, allows operation at high speed without heating.

Working parts are encased; dial plate has two rows of figures reading right or left, as the shaft may run, all nickel finish.

Rotating disc carried by friction, may be moved to the starting point where the raised knobs coincide.

Can be supplied with a 7½-inch spindle for use on dairy machines.

NO. 104—Weight each 5¼ Ounces	Each
In Pasteboard Box	$1.20
In Leather Case	1.80

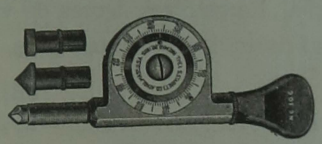


Fig. 860

Working parts enclosed as in a watch. Nickel plated and has a rubber handle that will not heat while running at high speed.

While looking at a watch, each hundred revolutions may be counted by allowing the oval head pin on the revolving disc to pass under the thumb as the instrument is pressed to its work.

Rotating disc carried by friction may be moved to the starting point where the raised knobs coincide.

NO. 106—Weight Each, 4¼ Ounces.	Each
In Pasteboard Box	$1.80
In Leather Case	2.40

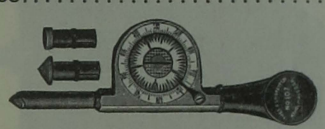


Fig. 861

Automatically registers hundreds as well as units and tens; will register 5,000 revolutions. Large dial is graduated into one hundred lines, each representing a revolution of the spindle. Small dial has fifty lines, each representing one hundred revolutions or one complete turn of the large dial. Hard rubber handle; makes a safe Insulator when used on electrical machinery. Nickel plated.

NO. 107—Weight Each, 6¼ Ounces.	Each
In Pasteboard Box	$3.60
In Leather Case	4.20

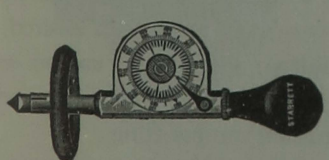


Fig. 862

SURFACE SPEED ATTACHMENT

Designed for use with one of the speed indicators, to show the number of lineal feet per minute the periphery of a shaft or pulley is running. Each revolution, 6 inches, or twice around, 1 foot.

	Each
NO. 109—Weight Each, 3 Ounces	$0.60

All Above, One in a Box

TACHOMETERS

JONES

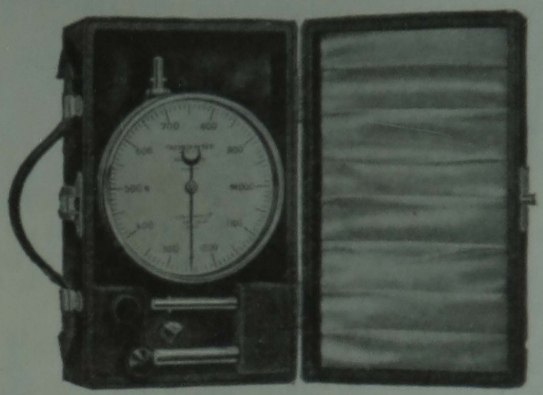


Fig. 863

Designed to fit the palm of the hand, but a handle can be supplied at a nominal cost if so desired; portable and adaptable to test speeds directly; figures on the dial are uniformly spaced and easily read. Supplied with a set of couplings comprising one each, Triangular steel tip, center punch for same, rubber tip, rubber funnel cup for pointed shafts, and extension rod. Finished black japanned body and nickel plated trimmings; packed complete in a handsome morocco carrying case.

TYPE H-2

NOS	1	2	3
R. P. M.	100–1200	500–2500	1000–5000
Diam. Dial, Inches	4	4	4
Weight, Each, Ounces	14	14	14
Each	$50.00	50.00	50.00

Note.—Standard dials are listed above, Special dials can be furnished at a slight increase in price.

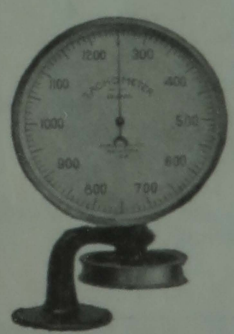


Fig. 864

STATIONARY

Especially adapted for belt drive, may be operated in a horizontal or vertical position; pulley grooved for ⅝ inch belt. Scale on dial uniform, insuring an instantaneous and accurate reading of the smallest speed variation; centrifugal type, mechanism consists of a ball governor mounted on a revolving shaft.

NOS	1	2	3	4
Diam. Dial, Inches	4	5½	7½	10
Weight, Each, Lbs	3	3¾	5	7
Each	$50.00	55.00	60.00	75.00

Dials furnished with any of the following graduations: A, 50 to 600 R.P.M.; B, 100 to 1200 R.P.M.; C, 1000 to 5000 R.P.M.

When ordering Tachometers please state: Purpose for which it is to be used; diameter of dial; normal working of speed; diameter of driving pulley or shaft; whether to be operated in a vertical or horizontal position.

COUNTING MACHINES

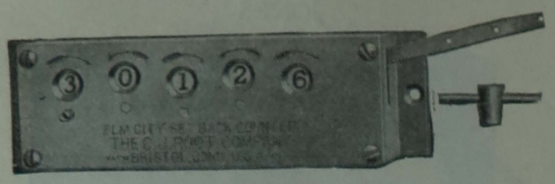


Fig. 865

ELM CITY

Case of polished brass; pinions, ratchet wheel and lever of cast steel; dial of whitened brass, with figures plainly etched in black; can quickly be set back to zero; operates any stroke over ⅞ inch.

NOS.	12	13	14	15	16
Height Case, Ins.	⅝	⅝	⅝	⅝	⅝
Width Case, Ins.	1¾	1¾	1¾	1¾	1¾
Length Case, Ins.	3¼	4	4¾	5½	6¼
Counts up to	100	1000	10,000	100,000	1,000,000
Figures	2	3	4	5	6
Weight Each, Ozs.	12	15	18	21	24
Each	**$4.00**	**5.25**	**6.60**	**7.60**	**8.60**

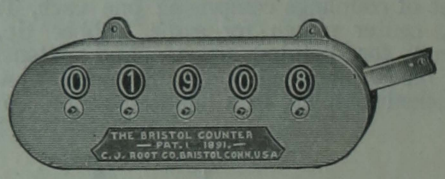


Fig. 866

BRISTOL

Case made of iron. Working parts of iron or steel; dials are white, having half-Inch black figures which are clear and easily read; can be quickly set to zero, or will repeat automatically when highest number is reached. Operates on any stroke 1½ Inches or over.

NOS.	4	5	6
Height Case, Inches	1⅜	1⅜	1⅜
Width Case, Inches	2½	2½	2½
Length Case, Inches	6¾	8	9¾
Counts up to	10,000	100,000	1,000,000
Figures	4	5	6
Weight Each, Lbs.	3½	3¾	4½
Each	**$5.60**	**6.60**	**7.60**

Note.—Nos. 4, 5 and 6 are nickel-plated; Nos. 4B, 5B and 6B are black enamel.

Fig. 867

MODEL A

Case, gray iron, black enameled; white steel dials, which are covered with glass; lever is forged steel. All working parts are steel, tempered and hardened; figures automatically revert to zero when counter has run its capacity and then repeat; can readily be set back to zero; adapted for speeds up to 250 strokes per minute.

NOS.	3A1	4A1	5A1	6A1
Height Case, Inches	1¾	1¾	1¾	1¾
Width Case, Inches	2¼	2¼	2¼	2½
Length Case, Inches	6	7	8¼	10
Counts up to	1000	10,000	100,000	1,000,000
Figures	3	4	5	6
Weight Each, Lbs.	2¾	3	3½	4
Each	**$7.50**	**8.50**	**10.00**	**12.00**

COUNTING MACHINES

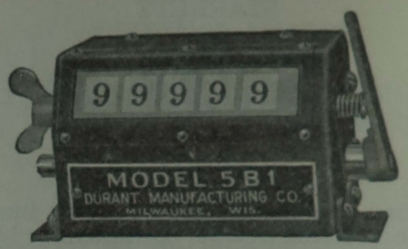


Fig. 868

MODEL B

Mechanism is enclosed in a heavy cast iron case, black enameled inside and out and thoroughly dust-proof; adapted for speeds up to 400 R.P.M.; unit driving parts are made of hardened steel with broad surfaces; gears and pinions of machined brass and steel. Lever can be set at any angle. Large black figures on white enameled background and covered with frosted glass.

NOS.	5B1	6B1
Height Case, Inches	2½	2½
Width Case, Inches	2	2
Length Case, Inches	3⅞	4½
Counts up to	100,000	1,000,000
Figures	5	6
Weight Each, Lbs.	2¾	3¼
Each, without Lock	**$10.00**	**12.00**
Each, with Lock	**$10.75**	**12.75**

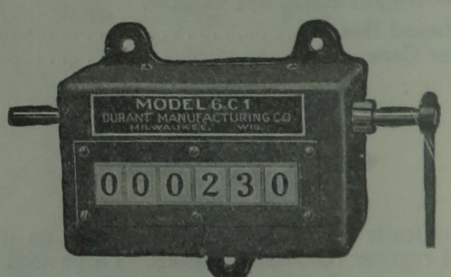


Fig. 869

MODEL C

Iron case is enameled inside and out; all steel parts are electro-galvanized; brass gears and bronze shafts used throughout. Has reciprocating action with a varying stroke without sticking or skipping, while the driving shaft may also be completely revolved if desired, recording one for each revolution; adapted for use on engines, pumps, compressors, stokers, automatic scales and heavy duty. Regularly furnished non-resetting.

NOS.	4C1	5C1	6C1
Height Case, Inches	3	3	3
Width Case, Inches	1¾	1¾	1¾
Length Case, Inches	4¾	4¾	4¾
Counts up to	10,000	100,000	1,000,000
Figures	4	5	6
Weight Each, Lbs.	3¼	3¼	3¼
Each	**$12.00**	**14.00**	**16.00**

RATCHET COUNTERS

Fig. 870

MODEL D—PRODUCTIMETER

The driving mechanism consists of a pair of hardened steel pawls, operating simultaneously on a hardened steel ratchet in a manner permitting a minimum stroke of only ¼ inch; machined brass gears and pinions; instantaneous reset lever is fitted with retaining spring for returning it to rest position; figures are black on white enameled background; used particularly on job presses, addressing machines, etc.

NOS.	4D1	5D1
Height Case, Inches	1⅝	1⅝
Width Case, Inches	1⅛	1⅛
Length Case, Inches	1¾	2⅛
Counts up to	10,000	100,000
Figures	4	5
Weight Each, Ounces	7	8
Each	$8.50	9.00

HAND COUNTERS

Fig. 871

Brass and steel parts with a fully nickel plated case; can be carried in pocket as they are the size of an ordinary watch; have knob set back, and can be reset to zero very readily.

NOS.	0	1
Size, Inches	2⅛	2⅛
No. of Dials	3	4
Weight Each, Ounces	6	6
Each	$3.00	4.00

REVOLUTION COUNTERS

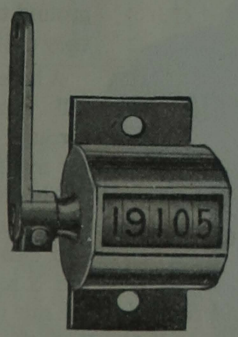


Fig. 872

Requires a complete revolution of the shaft for each registration; contains no springs in its entire construction, is most positive in action, and when properly attached can be thoroughly relied upon to give an absolutely accurate record. Its action is smooth and uniform and it will stand a very high rate of speed. If run backwards it subtracts; nickel plated, highly polished.

Each

NO. 4—Counts to 100,000; Five Figures; Weight Each 3 Ounces $2.00

All Above, One in a Box

ROTARY RATCHET COUNTERS

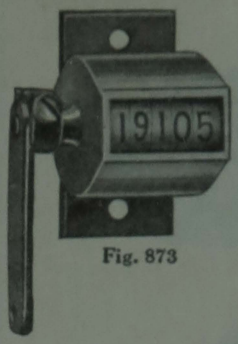


Fig. 873

With solid pawls and coiled springs.

No internal stops to regulate throw of the lever. Mechanism cannot be jammed by pushing the lever too far, since the latter can be rotated indefinitely in either direction. Will register only in the forward direction. The number of figures registered depends on the distance the lever is moved.

A complete revolution of the lever registers ten. When the lever is given a reciprocating movement, it must be moved through an angle of a little more than 36 degrees to cause the counter to register. This angle should be from 42 degrees to 60 degrees to insure positive action. The throw of the lever must be regulated by outside means.

Because there is no way to subtract count on one of these counters, it is very difficult to tamper with them. This makes them especially suitable to use for keeping a count of the work turned out by any operative. Each

NO. 6—Counts to 100,000, Five Figures; Weight Each, 3 Ounces $2.00

Can also be supplied with 3 or 4 figures.

SET BACK

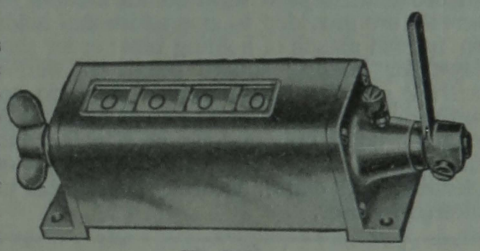


Fig. 874

Has no stops to limit the throw of the lever. Mechanism cannot be jammed by moving lever too far. Right hand wheel is carried forward by oscillating lever on driving shaft. Lever movement from 40 to 60 degrees. Will count one figure at each movement. Will count ten for each revolution. Number wheels will not move when turned backward. Each

NO. L2—Counts to 10,000, Four Figures; Weight Each, 1 Lb $10.50

Fig. 875

Indicates one for each oscillation of lever which moves through an angle of 45 degrees. Can be reset to zero by one turn of the knob. Ratchet and pawls are made of hardened steel and the springs of the best spring steel. Counter can be furnished with the drive shaft projecting either on the right or left hand side as desired; also with 3, 4 or 5 figure wheels. Regularly made with spring to return lever when moved, but may be omitted if not wanted. Each

NO. Z3—Counts up to 100,000, Five Figures; Weight Each, 6 Ounces $5.00

FORM R

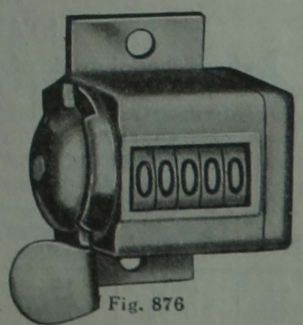


Fig. 876

Has solid pawls made from hardened tool steel pivoted at one end in a suitable bearing in the driving plate. They are held in engagement with the first ring by means of coiled springs made from the best piano wire. Counter is fitted with stops to limit the angular movement of the lever to 45 degrees. Furnished with thumb lever on left side. Counter cannot be turned backward. Each

NO. R8T—Counts up to 100,000; Five Figures; Weight Each, 3½ Ounces $2.50

DRILL CHUCKS

WESTCOTT

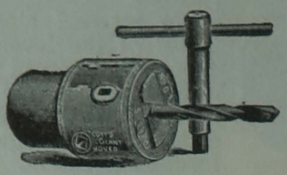


Fig. 877
Straight Body

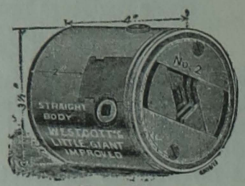


Fig. 878
Taper Body

LITTLE GIANT IMPROVED

Made of specially selected and prepared steel; furnished to order with jaws serrated for holding rough iron; side screws are provided to give additional holding power and to furnish means of holding taps; order should so state if jaws for holding square shank are wanted; jaws made with V grooves will not hold down to nothing; chucks with drill capacity of 1½ Inch or more are made with straight body only and can be attached only by means of face plate; chucks should be taken apart occasionally for cleaning and oiling; accuracy guaranteed unless chuck is altered by user.

NOS.	Holds Drills, Inches	Length Over All, Inches	Diameter Body, Inches	Weight Each, Lbs.	Each
00	0–¼	2 3/16	1 1/16	2¾	$8.00
0	0–½	3¼	2½	3½	9.00
1	0–¾	3 7/8	3	5¼	10.00
2	0–1	4 1/8	3½	6½	11.00
2½	0–1	4 3/8	4	10½	12.00
3	0–1½	4 3/8	6	28	20.00
4	0–2	4¼	6½	32	25.00

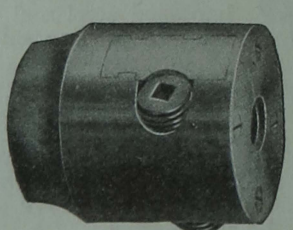


Fig. 879

STANDARD

Body of special grade of steel and will not break in service. Face plate adds to the strength of the body and prevents inserting work larger than chuck is designed for. Jaws of tool steel accurately machined and carefully tempered. Operating screw is of special analysis steel and is of large size. All parts are interchangeable.

NOS.	Capacity, Inches	Diameter, Inches	Length, Inches	Weight Each, Lbs.	Each
41	0–¼	1⅜	2 3/32	....	$6.00
42	0–⅜	1 11/16	2 15/32	....	6.50
43	0–½	2 3/16	2 13/16	....	7.00
44	0–¾	2 7/16	3⅜	....	8.00
45	0–1	3 7/16	4¼	....	10.00

DRILL CHUCKS

HORTON

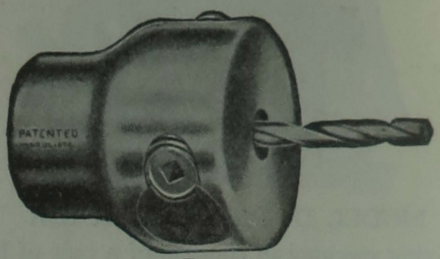


Fig. 880

STYLE BB

Adapted for the hardest service, such as for tapping heads, tapping machines and for holding turret lathe tools.

Jaws are cylindrical and made a close fit in the reamed hole in the body. They work freely and have no tendency to bind or cramp.

Constructed from best refined Steel; mechanically perfect, accurately designed. Tempered tool steel jaws.

Simple and compact, Composed of only four parts; accurately machined.

Nos. 1 to 4 fitted with Morse taper holes for arbor, Nos. 5 and 6 arranged for, use with face plate.

NOS.	Holds Drills, Inches	Length Over All, Inches	Diameter Body, Inches	Weight Each, Lbs.	Each
0	0–¼	1⅜	1⅜	1	$7.00
1	0–⅜	2⅛	1 5/16	2	7.50
2	0–½	2½	2 3/16	2½	8.00
3	0–¾	3¼	2 15/16	5	9.00
4	0–1	4	3½	8	10.00
5	0–1½	2¾	5¼	16	18.00
6	0–2	3⅜	6¼	28	20.00

SKINNER—NEW MODEL

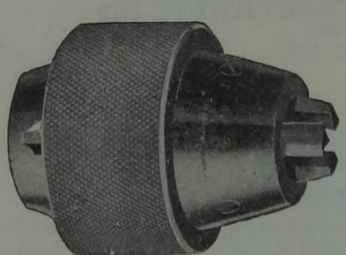


Fig. 881

Made from extra refined steel. Jaw ends are ground true in chuck after they are hardened.

A hole may be bored the full capacity of chuck through the center, thereby making it convenient for holding drill rod, etc. It is easily taken apart and cleaned by removing the 3 screws in the cap, taking off same, and revolving the nut until jaws become disengaged. On putting it together, the numbers on the jaw must correspond with numbers on the slot in chuck body. Operated by hand, tightened with spanner wrench.

NOS.	Holds Drills, Inches	Length Jaws Extended, Inches	Diameter Body, Inches	Wgt. Each, Lbs.	Each
11	0–7/32	2⅛	1⅜	½	$5.50
12	0–⅜	2 13/16	1 15/16	1⅕	5.50
13	0–17/32	4 1/16	2 11/16	3½	9.00

DRILL CHUCKS

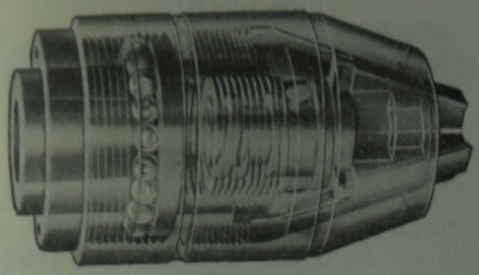


Fig. 882

MORROW—BALL BEARING

Hand operated, ball bearing drill chuck with automatic grip. Releases quickly and easily by hand. Screw, releaser and head of spindle are thoroughly hardened. Jaws are from a high grade alloy steel and ground all over so perfectly to gauge that no grinding on bite is required after assembly. Hoods are hardened all over and the inside is ground to a correct surface. Large ball bearings are used between the ring and the flange of the head.

NOS.	Capacity, Inches	Diameter, Inches	Length, Inches	Weight Each, Lbs.	Each
1	0–1/4	1 1/4	2 11/16	3/4	$7.00
2	0–3/8	1 5/8	3 27/64	1 1/2	7.50
3	0–1/2	2 3/16	4 9/32	3	9.00
4	1/4–3/4	2 5/8	5 1/8	5	18.00
5	1/2–1	3	5 37/64	7 1/8	25.00

ALMOND

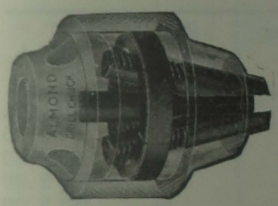


Fig. 883

STANDARD

Made from best refined steel, jaws carefully hardened; accurate and powerful; operated by hand or by spanner wrench.

NOS.	Holds Drills, Inches	Length Over All, Inches	Diameter Body, Inches	Weight Each, Lbs.	Each
1	0–3/16	1 1/2	1 1/8	1/4	$5.50
2	0–5/16	2 1/8	1 5/8	3/4	5.50
3	0–1/2	2 5/16	2 5/16	2 1/4	9.00

GEARED

Small in diameter and carries a large drill. Geared teeth on a tool steel nut meshing with a tool steel pinion of large diameter gives a direct drive with increased tightening power. Pinion holes are bushed to prevent wear.

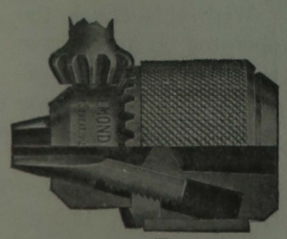


Fig. 884

NOS.	Holds Drills, Inches	Length Over All, Inches	Diameter Body, Inches	Weight Each, Lbs.	Each
5	0–3/16	1 1/2	1 3/16	3/4	$5.50
7	0–3/8	2 5/16	1 7/8	1 1/4	5.50
9	0–1/2	3 1/16	2 1/2	2 1/2	9.00
10	0–3/4	4 1/4	3	5 1/2	18.00
11	0–1	4 3/4	3 3/8	7 1/2	25.00

DRILL CHUCKS

JACOBS

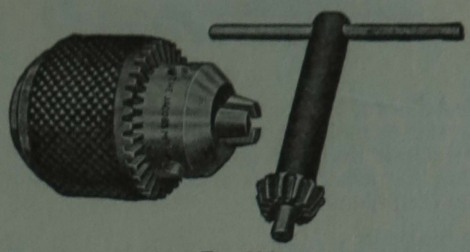


Fig. 885

CHAMFERED BACK

Constructed from best refined steel, mechanically perfect, accurately designed. Three tempered tool steel jaws regulated with wrench, which also operates cam nuts, holding jaws firm. Hole may be bored through body of chuck full size of its capacity, making it adaptable for holding drill rods, etc.

Cover all the requirements for convenient, efficient, accurate and durable drill chucks for portable use and for use on sensitive and high speed drill presses, lathes, tapping machines and other purposes.

NOS.	Capacity, Inches	Length Jaws Extended, Inches	Diameter Body, Inches	Wgt. Each Packed, Lbs.	Each
1	0–13/64	1 15/16	1 3/16	7/16	$5.50
2	0–21/64	2 3/4	1 11/16	1	5.50
3	0–17/32	3 15/16	2 5/16	3	9.00
4	1/16–3/4	4 15/16	2 7/8	6	18.00
5	3/8–1	5 5/16	3 3/8	8	25.00
6	0–1/2	3 9/16	1 7/8	1 1/2	9.00

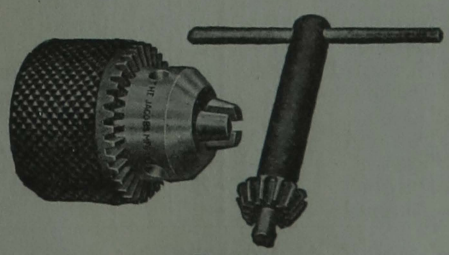


Fig. 886

FLAT BACK

Same as above but without the chamfered portion at the back, making it shorter than the regular chuck. Extensively used on electric, pneumatic and flexible shaft drills.

NOS.	Capacity, Inches	Diameter, Inches	Length, Inches	Weight Each, Lbs.	Each
1A	0–1/4	1 13/16	1 3/16	7/16	$5.50
2A	0–3/8	2 9/16	1 11/16	1	5.50
3A	0–17/32	3 5/8	2 5/16	2 1/2	9.00
6A	0–1/2	3 3/8	1 7/8	1 1/2	9.00

ARBORS

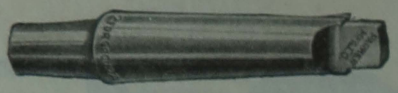


Fig. 887

Center Arbors of taper or straight shank can be furnished to fit any size or make of drill chuck. Made of steel with hardened shank and ground true to gauge. Prices on application for arbors with shank for blacksmith drill presses or with blank end.

MORSE TAPER SHANK		STRAIGHT SHANK	
Shank NOS.	Each	Size Shank, Inches	Each
1	$0.75	1/2	$0.75
2	.75	5/8	.80
3	1.25	41/64	.90
4	1.50	3/4	1.00
5	2.00	1	1.25

NOS. 1, 2, 3, 4 AND 5 MORSE TAPER SHANKS

Fitting different makes and sizes of drill chucks interchangeable on the same arbors.

Group	NOS.	Make	Size	Group	NOS.	Make	Size
A	1	Parker	0–1/4		00	Skinner	0–3/8
	1	Jacobs	0–13/64		000	Skinner	0–1/4
	1A	Jacobs	0–1/4		100	Skinner	0–1/2
	6A	Almond	0–1/4		41	Skinner	0–1/4
	05	New Britain	0–3/16		42	Skinner	0–3/8
	11	Skinner	0–7/32		43	Skinner	0–1/2
	21	Skinner	0–1/4	F	48	Skinner	.....
	1	Union Czar	0–3/16		50	Skinner	0–3/8
B	2	Parker	0–3/8		51	Skinner	0–1/2
	2	Jacobs	0–21/64		0	Standard	0–3/8
	2A	Jacobs	0–3/8		00	Standard	0–1/4
	7	Almond	0–3/8		1	Standard	0–1/2
	06	New Britain	0–11/32		3	Almond	0–1/2
	12	Skinner	0–3/8		07	New Britain	0–17/32
	22	Skinner	0–3/8	R	13	Skinner	0–17/32
	2	Union Czar	0–5/16		23	Skinner	0–17/32
C	3	Parker	0–17/32		3	Union Czar	0–1/2
	3	Jacobs	0–17/32	T	6	Jacobs	0–1/2
	3A	Jacobs	0–17/32		6A	Jacobs	0–1/2
	9	Almond	0–1/2		0	Little Giant	0–1/2
	44	Skinner	0–3/4	V	2	Horton	0–1/2
	52	Skinner	0–3/4		100	Union	0–1/2
	101	Skinner	0–3/4		3	Horton	0–3/4
	2	Standard	0–3/4	W	1	Little Giant	0–3/4
D	4	Parker	1/8–3/4		2	Little Giant	0–1
	4	Jacobs	1/16–3/4		45	Skinner	0–1
	10	Almond	0–3/4	X	53	Skinner	0–1
E	5	Parker	3/8–1		102	Skinner	.....
	5	Jacobs	3/8–1	Z	3	Standard	0–1
	11	Almond	3/8–1				

Fitting sizes of chucks of different makes not interchangeable on the same arbors.

Make	NOS.	Size	Make	NOS.	Size
Gronkvist	1	5/64–11/64	Hartford	0	0–3/8
	2	11/64–5/16		1	0–1/2
	3	5/16–1/2		2	0–3/4
	4	1/2–3/4		3	1/16–1
Horton	0	0–1/4	Reid	0	.....
	1	0–3/8		1	.....
	4	0–1		2	.....
National	1 and 8	0–1/4	Morrow	1	0–1/4
	2 and 9	0–3/8		2	0–3/8
	3 and 10	0–1/2		3	0–1/2
	4 and 11	0–3/4		4	1/4–3/4
	5 and 12	0–1		5	1/2–1
Pratt	1	0–1/2	Union	000	0–1/4
	2	0–3/4		00	0–3/8
	3	0–1		101	0–3/4
				102	0–1

DRILL CHUCKS

FOR LATHES

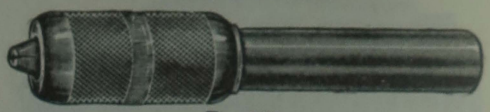


Fig. 888

WITH ROUND EXTENSION SHANK

Nickeled chuck; solid steel shank. Chuck holds, and centers with reasonable accuracy, round shanks from 1/8 to 1/2 Inch in diameter, bit stock and No. 1 Morse Taper Shanks.

	Each
NO. 150—Diameter, 1 1/2 Inches; shank, 2 1/2 Inches long	$2.00

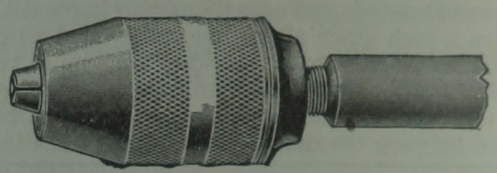


Fig. 889

THREE JAW

These chucks have three jaws, carefully adjusted in a socket, opening with a spring and closing with pressure from spindle. Handsomely nickeled substantial chucks. The Nos. 15, 16 and 17 are the same as Nos. 5, 6 and 7, except that shanks are of the bit stock pattern, permitting chucks to be used in bit braces, breast drills and other tools.

NOS.	Capacity, Inches	Diameter Body, Inches	Weight Back, Lbs.	Each
5	1/4	1	3/4	$1.75
6	3/8	1 1/4	3/4	2.65
7	1/2	1 1/2	1	3.50
15	1/4	1	3/4	2.20
16	3/8	1 1/4	3/4	3.00
17	1/2	1 1/2	1	4.00

COLLET CHUCKS

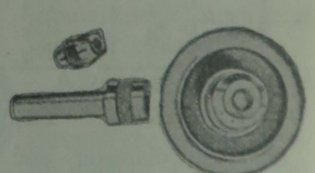


Fig. 890

Takes the place of the usual draw-in collet chuck made for engine lathes.

With this chuck the operator does not have to leave his regular position to tighten or release the collet. The chuck takes the place of the center in the spindle. The body, as well as the nosepiece, is made of high-grade steel, heat-treated, hardened and ground. The collet is made of tool steel tempered in oil. It is split back about three-fourths of the way from both ends, and when tightened up on the bar by means of the handwheel, it grips the stock the full length of the collet.

NOS.	0	1	2
Taper Shank Nos.	2	4	5
Capacity, Round Stock, Inches	5/8	3/4	1
Capacity, Hexagon Stock, Inches	1/2	5/8	3/4
Capacity, Square Stock, Inches	7/16	9/16	11/16
Each, With Collet for Round Stock	$22.50	25.00	27.50

TAPPING CHUCKS

AUTO—REVERSE

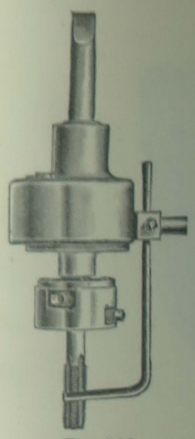


Fig. 891

POSITIVE

For rapid tapping with a drill press or lathe. Requires no stop or reverse on the press. Stops automatically and backs the tap out with a quick return. The tap automatically stops when the end of the thread is reached and raising the spindle engages the reverse mechanism, giving the tap rapid reverse motion.

STYLE B

NOS.	Holds Taps, Inches: Standard	Holds Taps, Inches: Pipe	Morse* Taper Shank Nos.	Weight Each, Lbs.	Each
00	1/16-3/8	....	1, 2	4 3/4	$25.00
0	1/8- 5/8	1/4	3, 2	7	30.00
1	1/4- 3/4	1/2	3, 4	13 3/4	35.00
2	5/16-1	1/2	4	25	40.00
3	5/8-1 1/4	1	4	27 3/4	50.00
4	5/8-1 1/2	1 1/4	5, 4	42 3/4	70.00
5	3/4-2	1 1/2	5	46	80.00

* The first size of Taper Shank shown is the one regularly furnished.

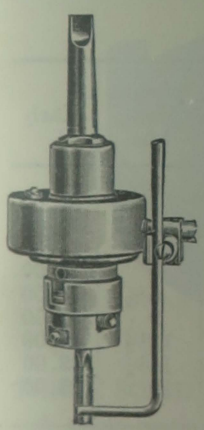


Fig. 892

FRICTION DRIVE

Equipped with a friction driven clutch for tapping steel, bronze and other tough metals and for tapping blind holes without danger of breaking taps. The friction can be adjusted to the work or can be changed to a positive drive by slipping a key into the spindle through the slot under the lug of the fibre check washer. Reverses the same as the positive drive.

STYLE C

NOS.	Holds Taps, Inches: Standard	Holds Taps, Inches: Pipe	Morse* Taper Shank Nos.	Weight Each, Lbs.	Each
00	1/16- 3/8	....	1, 2	5 1/2	$30.00
0	1/8- 5/8	1/4	3, 2	8 1/4	35.00
1	1/4- 3/4	1/2	3, 4	15	40.00
2	5/16-1	1/2	4	28 1/2	50.00
3	5/8-1 1/4	1	4	32 1/2	60.00
4	5/8-1 1/2	1 1/4	5, 4	50	80.00
5	3/4-2	2	5	54	90.00

* The first size of Taper Shank shown is the one regularly furnished

TAPPING DEVICES

JARVIS—HIGH SPEED

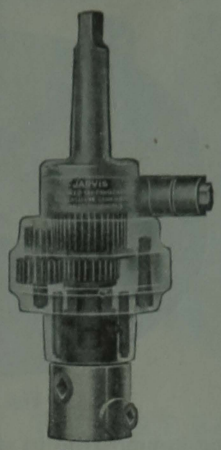


Fig. 893

A device to convert drilling machines or lathes into tapping machines. The drive is transmitted through three hardened steel balls which are automatically released when the required depth of thread is reached and the tap is given automatic rapid reverse motion. Special taps are not required with these devices as specially designed chucks are provided which form a part of the tapping devices. Every part machined to the highest standard of accuracy and made from high grade materials. Gears are of chrome-nickel steel, heat-treated; all wearing parts are carefully hardened.

POSITIVE—STYLE "M"

NOS.	Taper Shank Nos.	Largest Diameter, Inches	Depth Shank to Chuck, Inches	Depth of Chuck, Inches
0	1 or 2	2 5/8	3 1/16	1 3/16
1	1 or 2	2 5/8	3 3/16	1 1/4
1 1/2	2 or 3	3 5/16	3 1/2	1 5/16
2	3 or 4	3 7/8	3 7/8	2
2 1/2	4 or 5	4 1/2	5 1/4	2 5/16
3	4 or 5	5 1/2	5 3/4	2 5/8
4	4 or 5	6	7	4 1/4

NOS.	Holds Taps, Inches: Standard	Holds Taps, Inches: Pipe	Weight Each, Lbs.	Each
0	0- 3/16	....	3	$23.00
1	1/16-3/8	....	3 1/2	25.00
1 1/2	1/4-9/16	1/4	6 1/2	30.00
2	5/16-13/16	1/2	9 3/4	35.00
2 1/2	7/16-1 1/16	3/4	17 1/2	45.00
3	5/8-1 1/2	1	29	70.00
4	3/4-2	1 1/2	49	80.00

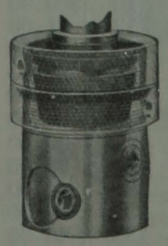


Fig. 894

FRICTION

When tapping is to be done in tool steel or any tough metal, or when blind holes are to be tapped, a cone-friction chuck can be furnished. Capacities are the same as apply to positive style.

STYLE "N"

NOS.	Taper Shank Nos.	Largest Diameter, Inches	Depth Shank to Chuck, Inches	Depth of Chuck, Inches	Weight Each, Lbs.	Each
0	1 or 2	2 5/8	3 3/16	1 3/4	3 3/4	$30.00
1	1 or 2	3 5/16	3 1/2	2 1/8	4 1/2	35.00
1 1/2	2 or 3	3 7/8	3 7/8	2 1/2	7 3/4	40.00
2	3 or 4	4 1/2	5 1/4	3 3/8	10 1/2	45.00
2 1/2	4 or 5	5 1/4	5 3/4	4 1/4	19	65.00
3	4 or 5	6	7	5 1/2	34	85.00
4	4 or 5	6	7	7	56	95.00

Regularly designed for right-hand tapping. Can be furnished to order for left-hand tapping at special price.

LATHE CHUCKS

INDEPENDENT

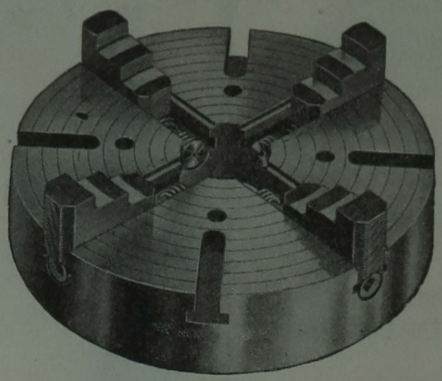


Fig. 895

Highly finished castings; face being ground true to straight edge and accurately graduated in inches.

Jaws are of steel, thoroughly case-hardened, and have raised and ground steps. They are reversed by running off the screw at the periphery and turning end for end. Jaws operate independently.

Screws are made of a fine quality of steel, are of large diameter with a heavy square thread, are nicely fitted to the bearings, and are threaded the full length, giving a long range of adjustment to the jaws.

Hardened steel thrust bearings for the jaw adjusting screws are furnished.

Set of 4 bolts is furnished with each Chuck.

The Chuck is provided with a recess in the back, to which a face plate is fitted, this plate also being fitted to the lathe or machine spindle. It is never furnished except as an extra.

Wrench is of steel, drop-forged and case-hardened.

FOUR JAW—IRON BODY

The larger sizes being very heavy, 8 inch and smaller have solid face. 9 inch and 10 inch have openings in the face between the jaws. 12 inch to 16 inch have T slots in the face. 18 inch and larger have T slots and openings in the face.

NOS.	Size Chuck, Inches	Capacity, Inches	Diameter Face Plate Recess, Inches	Weight Each, Lbs.	Each
1404	4½	6	4	10	$20.00
1405	5	7	3 11/16	12	21.00
1406	6	7½	5	17	22.00
1407	7½	8¾	5	23	25.00
1408	8	9½	5	34	26.00
1409	9	11½	5	42	28.00
1410	10	12½	6	49	30.00
1412	12	14½	6⅜	80	35.00
1414	14	16½	7¾	105	40.00
1415	15	18	8	122	43.00
1416	16	19	8¾	133	46.00
1418	18	21	10	175	54.00
1420	20	23	11	195	62.00
1421	21	24	11	215	66.00
1422	22	25	12	226	70.00
1424	24	27	13	270	80.00
1426	26	29	14	315	93.00
1428	28	31	15	340	110.00
1430	30	35	15	485	130.00
1432	32	36	18	540	155.00
1434	34	38	18	560	180.00
1436	36	41	18	715	210.00
1438	38	43	20	1089	245.00
1440	40	45	20	1175	280.00
1442	42	47	20	1203	320.00
1444	44	49	20	1250	360.00
1446	46	52	20	1500	420.00
1448	48	54	20	1600	500.00

LIGHT PATTERN—IRON BODY

For use on light lathes and for amateur work.

These chucks although light and not intended for general shop use are well built and finished with care and accuracy. They will be found thoroughly satisfactory on light work.

THREE JAW

NOS.	Size Chuck, Inches	Diameter Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
2302	2	1 13/16	2¼	1	$9.00
2302½	2½	1 31/32	2¾	1¼	10.00
2303	3	2 11/16	3¾	2	11.00
2304	4	2 31/32	5	3	13.00
2305	5	2 31/32	6	5¼	15.00
2306	6	3 25/32	7¼	9	17.00
2307½	7½	3 25/32	8¾	12½	19.00
2309	9	3 25/32	10½	15½	22.00
2310	10	4 29/32	11½	19	25.00

FOUR JAW

NOS.	Size Chuck, Inches	Diameter Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
2402	2	1 13/16	2¼	¾	$11.00
2402½	2½	1 31/32	2¾	1¼	12.00
2403	3	2 11/16	3¾	2	13.00
2404	4	2 31/32	5	4	15.00
2405	5	2 31/32	6	5¼	17.00
2406	6	3 25/32	7¼	9	20.00
2407½	7½	3 25/32	8¾	12½	22.00
2409	9	3 25/32	10½	15½	25.00
2410	10	4 29/32	11½	19	28.00

LATHE CHUCKS

INDEPENDENT

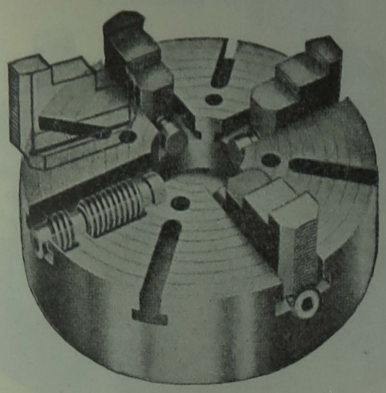


Fig. 896

HEAVY IRON BODY—FOUR JAW

The design of these chucks furnishes large capacity, broad bearings and large sections. The screws are supported on three journal bearings and there are two thrust bearings. Broad base and large width of the jaws affords good support and a large engagement between the screw and jaw.

NOS.	Size Chuck, Inches	Capacity, Inches	Each	NOS.	Size Chuck, Inches	Capacity Inches	Each
3408	8	8	$28.00	3418	18	18	$60.00
3410	10	10	34.00	3421	21	21	78.00
3412	12	12	39.00	3425	25	25	105.00
3415	15	15	48.00	3430	30	30	165.00

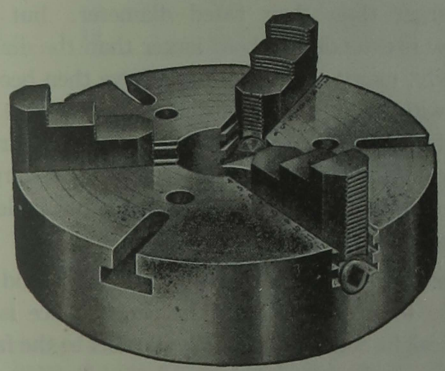


Fig. 897

THREE SOLID REVERSIBLE JAWS—IRON BODY

A single casting, well proportioned, of great strength, highly finished, the face being ground true to straight edge and accurately graduated in inches, the larger sizes being very heavy. 8 inch and smaller have solid face. 9 inch and 10 inch have openings in the face between the jaws. 12 inch to 16 inch have T slots in the face. 18 inch and larger have T slots and openings in the face.

NOS.	Size Chuck, Inches	Capacity, Inches	Each	NOS.	Size Chuck, Inches	Capacity, Inches	Each
6406	6	7½	$20.00	6414	14	16½	$37.00
6407	7½	9¾	23.00	6415	15	18	40.00
6408	8	10¾	24.00	6416	16	19	43.00
6409	9	11¾	26.00	6418	18	21	50.00
6410	10	12¾	28.00	6421	21	24	60.00
6412	12	14½	32.00	6424	24	27	72.00

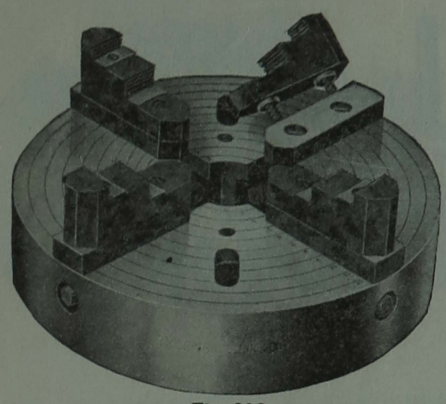


Fig. 898

TWO-PIECE REVERSIBLE JAWS—IRON BODY

Special Grinding-Machine Chuck

Well proportioned casting, carefully machined, highly finished, the face being ground true to straight edge, and perfectly parallel to face plate seat. Accurately graduated in inches. Jaws are of steel with full threaded nut, carefully case hardened; raised and ground steps; they are reversed above the face of the chuck without disturbing the lower section or jaw body. Hardened steel bushings fitted into the upper sections engage in both sections and receive the end thrust and relieve the strain on the binding screws.

NOS.	Size Chuck, Inches	Capacity, Inches	Wgt. Each, Lbs.	Each
5404	4	4¾	10	$26.00
5406	6	8	22	30.00
5408	8	9¼	30	34.00
5410	10	10¾	45	40.00
5412	12	13½	65	48.00

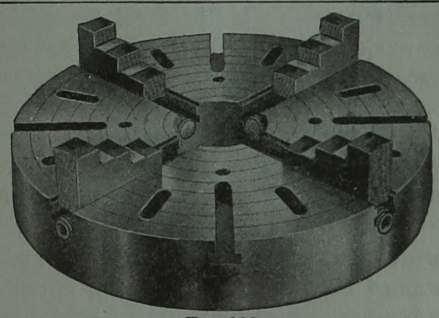


Fig. 899

STEEL BODY—FOUR JAW

Body is cast steel of high tensile strength. Designed especially for the heaviest class of work in railroad shops and government works, where it has given entire satisfaction.

The jaws are extra wide and the adjusting screws are of large diameter with a heavy square thread nicely fitted in the bearings and threaded their full length, giving a long range of adjustment of the jaws. The bearings for receiving the thrust of the jaw adjusting screws are hardened steel.

NOS.	Size Chuck, Inches	Capacity, Inches	Each	NOS.	Size Chuck, Inches	Capacity, Inches	Each
4406	6	7½	$36.00	4422	22	25	$114.00
4408	8	9½	42.00	4424	24	27	130.00
4409	9	11½	46.00	4426	26	29	150.00
4410	10	12½	50.00	4428	28	31	175.00
4412	12	14½	58.00	4430	30	35	200.00
4414	14	16½	67.00	4432	32	37	240.00
4415	15	18	71.00	4434	34	39	300.00
4416	16	19	76.00	4436	36	41	345.00
4418	18	21	87.00	4442	42	44	500.00
4420	20	23	100.00				

LATHE CHUCKS
INDEPENDENT

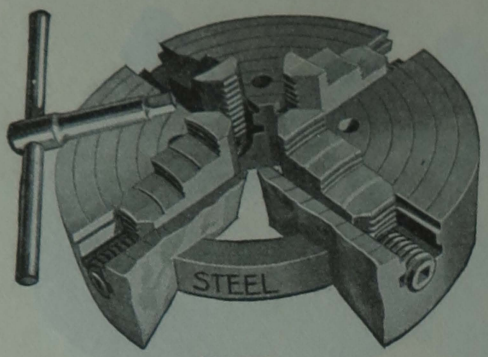


Fig. 900

STEEL RE-ENFORCED

A combination of the best in iron and steel chucks. In all iron body chucks, especially in the larger sizes, there is a tendency on the part of the body to spring out of shape, or break when great strain is put upon it. To eliminate this, a steel re-enforcement has been devised and patented, which makes it impossible for a chuck to spring or break. The body, made of the best cast iron obtainable, is re-enforced by a solid electrically welded steel ring. This ring is centered into the mold before the chuck body is cast. When the iron is poured, it surrounds the ring, making it an integral part of the body.

Thus the re-enforcing steel acts as a band in holding the body firm even under the greatest stress and the chuck cannot spring. Steel body chucks spring out of shape and iron body chucks break, but the Steel Re-enforced Chuck will neither spring nor break.

The operating screws of the Steel Re-enforced Lathe Chuck are made of fine quality steel and are threaded to the extreme end, thus giving the jaws the greatest possible gripping capacity. Each screw has a steel bearing in the centre. This feature makes it possible for some portion of the jaw to be always over the bearing, thereby eliminating any danger of the screw being raised out of the bearing when the chuck is in use.

The thrust bearing is formed by the steel re-enforcing ring mentioned above and, as this ring is cast into the body, the bearing formed by it cannot work loose.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
7404	4	5½	8	$20.00
7406	6	7¼	20	22.00
7408	8	9½	32	26.00
7409	9	11½	39	28.00
7410	10	12¼	43	30.00
7412	12	14¾	80	35.00
7414	14	17	93	40.00
7415	15	18½	110	43.00
7416	16	19½	123	46.00
7418	18	22	165	54.00
7420	20	24	198	62.00
7422	22	26½	235	70.00
7424	24	28½	273	80.00
7426	26	30	304	93.00
7428	28	32½	418	110.00
7430	30	35½	476	130.00
7436	36	42	640	210.00

LATHE CHUCKS
INDEPENDENT

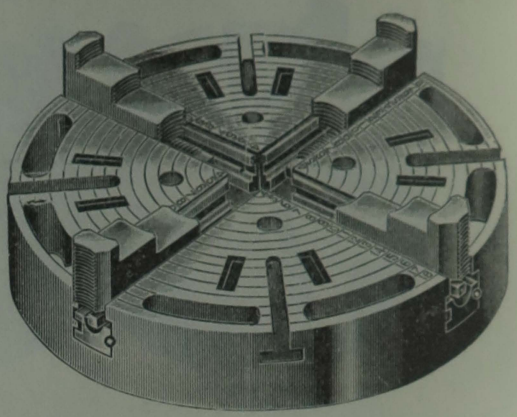


Fig. 901

REVERSIBLE JAWS

Furnished with Three or Four Jaws

Designed for use where the service requires unusual holding power. Stronger than any other Independent Chuck because the end thrust and strain comes upon the Chuck body at its strongest point. When Chuck is required to hold work larger than its diameter, Screw Carriers can be drawn outward together with Jaws and their adjusting Screws.

The capacity of these chucks is as great as any chuck made of this type, and they will hold pieces from 1 to 4 inches larger than their rated diameter; but when a chuck jaw is extended to hold larger than the diameter of chuck body, many of the jaw teeth have then become disengaged with the screw threads, and the wider the chuck is opened the fewer jaw teeth and screw threads are left to withstand all the strain from holding the extra large work. The safe capacity of this type of chuck is but little beyond its nominal size.

All parts of these chucks are machined and ground accurately to size after being hardened; face is ground true to straight edge and perfectly parallel to the face plate seat. Accurately graduated in inches. Jaws are of steel, case hardened. Screw bearings are hardened steel.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
8404	4 9/16	6	14	$21.00
8406	6	7½	22	22.00
8408	8	9½	39	26.00
8410	10⅛	12½	51	30.00
8412	12	15	72	35.00
8413	13¼	17	88	38.00
8414	14	18	92	40.00
8416	16	20	155	46.00
8418	18½	23	190	56.00
8421	21¼	26	280	68.00
8424	24	30	320	80.00
8427	27	33	400	105.00
8430	30	36	447	130.00
8436	36	43	650	210.00

FACE PLATE JAWS

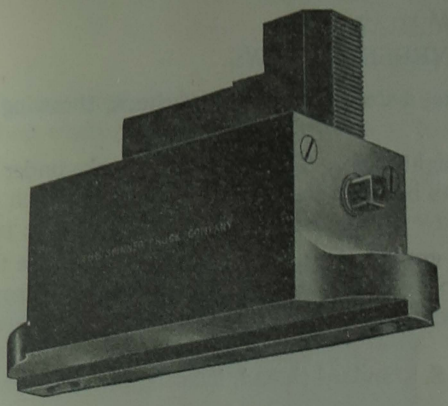


Fig. 902

REVERSIBLE

For use on face plates of large lathes. Rib cast solid on bottom adds to the strength of the body and can easily be fitted to the slot in the face plate.

IRON BODY—SINGLE RIB

NOS.	Size, Inches	Weight Per Set of Four, Lbs.	Per Set of Three	Per Set of Four
104	4	34	$30.00	$40.00
106	6	100	39.00	52.00
108	8	185	48.00	64.00
110	10	240	60.00	80.00
112	12	270	84.00	112.00
114	14	375	108.00	144.00
STEEL BODY—SINGLE RIB				
206	6	100	$54.00	$72.00
208	8	185	69.00	92.00
210	10	240	90.00	120.00
212	12	270	120.00	160.00
214	14	375	165.00	220.00

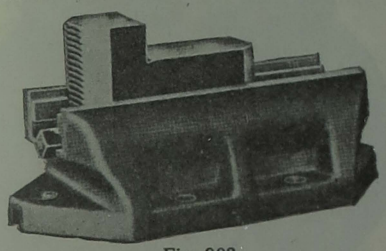


Fig. 903

Interchangeable for different face plates; operating screws have double thrust bearings; ends of jaws are pointed allowing close fit for holding small diameter work. Set of square head bolts with each set of jaws.

IRON BODY

NOS.	Size, Inches	Weight per Set of Four, Lbs.	Per Set of Three	Per Set of Four
304	4	34	$30.00	$40.00
306	6	100	39.00	52.00
308	8	120	48.00	64.00
310	10	225	60.00	80.00
312	12	300	84.00	112.00
314	14	400	108.00	144.00
STEEL BODY				
406	6	110	$54.00	$72.00
408	8	130	69.00	92.00
412	10	240	90.00	120.00
412	12	320	120.00	160.00
414	14	430	165.00	220.00

BORING MILL JAWS

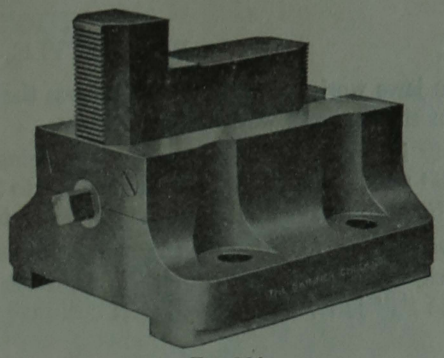


Fig. 904

REVERSIBLE

For use on boring mill tables. Furnished with double ribs, being used on boring mill tables and lathe face plates where there are parallel slots usually six inches center to center. Can be altered for different widths of ribs and spacing when desired.

IRON BODY—DOUBLE RIB

NOS.	Size, Inches	Weight Per Set of Four, Lbs.	Per Set of Three	Per Set of Four
506	6	$51.00	115	$68.00
508	8	63.00	200	84.00
510	10	81.00	260	108.00
512	12	105.00	330	140.00
514	14	135.00	400	180.00
STEEL BODY—DOUBLE RIB				
606	6	$84.00	125	$112.00
608	8	108.00	220	144.00
610	10	138.00	280	184.00
612	12	180.00	350	240.00
614	14	225.00	430	300.00

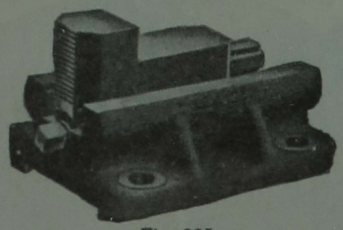


Fig. 905

With two parallel ribs, spaced 6 inches center distance. Sliding jaws are made of extra length so as to largely cover the screw. Can be used on very heavy or forge lathes when face plates have suitable slots.

IRON BODY

NOS.	Size, Inches	Weight Per Set of Four, Lbs.	Per Set of Four
706	6	115	$68.00
708	8	200	84.00
710	10	260	108.00
712	12	330	140.00
714	14	400	180.00
STEEL BODY			
806	6	125	$112.00
808	8	220	144.00
810	10	280	184.00
812	12	350	240.00
814	14	430	300.00

Wrench and complete set of bolts with each set of jaws

COMBINATION LATHE CHUCKS

GEARED SCREW

WITH STYLE "J" PATENT REVERSIBLE JAWS

The jaws work universally to and from the center, but by shifting a stud on the back of chuck, throwing the gears out of mesh, the jaws work independently.

Body is highly finished casting; face being ground true to straight edge. The three-jaw Chucks under 12 inches have solid faces. Three-jaw Chucks 15 inch to 24 inch have two slots between the jaws. 27 inch to 36 inch three-jaw Chucks have three slots between the jaws. 15 inch to 36 inch four-jaw Chucks have two slots between the jaws.

Jaws of drop forged steel; thoroughly hardened with raised and ground steps. Jaws are reversed above the face of the chuck without removing from the adjusting screws. There is no considerable strain on the binding screws in the reversible "J" jaws, as hardened steel bushings (fitted in the upper section) engage in both sections and receive the end thrust.

Screws of a fine quality of steel, and of liberal diameter with U. S. Standard thread, insuring the strongest possible gripping power.

A set of bolts and nuts is furnished with each chuck for attaching to face plate.

The wrench furnished is of drop forged steel, hardened.

The chuck is provided with a recess in the back, to which a face plate is fitted, this plate also being fitted to the lathe or machine spindle. It is never furnished except as an extra. When desired rough face plate casting can be furnished or a finished face plate made ready to attach to machine if favored with sample plate from machine to which chuck is to be attached.

The Geared Screw type of chuck has extra strong gearing and a very powerful grip.

The purchase of a three-jaw Chuck is recommended in preference to the four-jaw type when ordered in the Universal pattern.

The Combination Chuck is especially useful in the tool room and machine shop where a large variety of work is to be handled.

Combination Lathe Chucks can be used either universally or independently, but care should be taken in changing from the independent position to make the jaws true universally.

These Chucks are recommended for use where accuracy is essential.

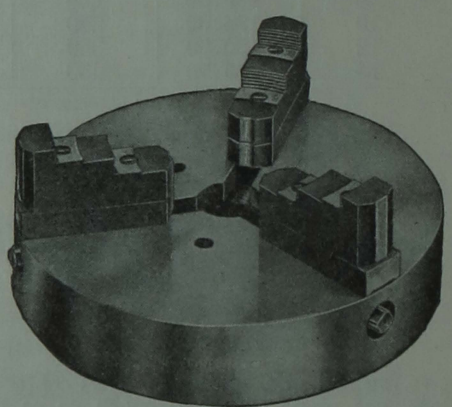


Fig. 906

IRON BODY—THREE JAW

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Universal Each	Combination Each
9303	3	3¾	12	$24.00	$26.00
9304	4	4 1/16	21	27.00	29.00
9305	5	5¾	26	30.00	32.00
9306	6	7¼	40	32.00	35.00
9308	8	8⅝	47	38.00	42.00
9309	9	9½	75	41.00	45.00
9312	12	12⅞	113	49.00	56.00
9315	15	16⅝	137	60.00	70.00
9318	18	18¾	175	75.00	87.00
9321	21	21¼	269	96.00	110.00
9324	24	25	374	120.00	136.00
9327	27	28½	396	145.00	160.00
9330	30	31¾	533	180.00	200.00
9336	36	37	631	235.00	264.00
9342	42	42¼	.....	300.00	360.00

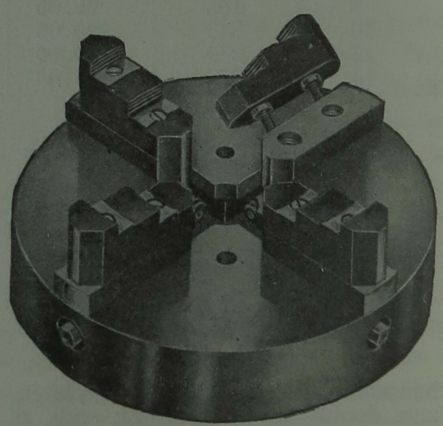


Fig. 907

IRON BODY—FOUR JAW

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Universal Each	Combination Each
9404	4	4 1/16	21	$34.00	$36.00
9405	5	5¾	26	37.00	39.00
9406	6	7¼	40	39.00	42.00
9408	8	8⅝	47	46.00	50.00
9409	9	9½	75	50.00	54.00
9412	12	12⅞	113	59.00	66.00
9415	15	16⅝	137	72.00	82.00
9418	18	18¾	175	90.00	102.00
9421	21	21¼	269	116.00	130.00
9424	24	25	374	144.00	160.00
9427	27	28½	396	177.00	192.00
9430	30	31¾	533	220.00	240.00
9436	36	37	631	296.00	325.00
9442	42	42¼	.....	390.00	450.00

COMBINATION LATHE CHUCKS

GEARED SCROLL—IRON BODY

With solid reversible jaws.

May be operated either as universal or as independent chucks, and are especially useful in the tool room and machine shop where a large variety of work is to be handled.

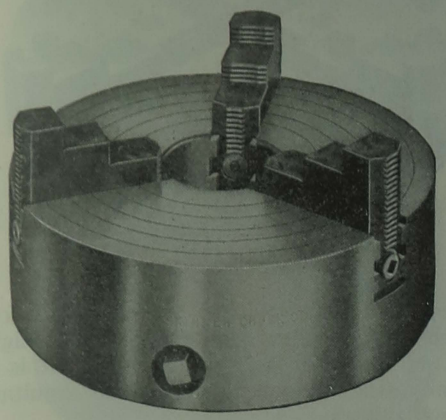


Fig. 908

Body of highly finished castings; face being ground true to straight edge. The three-jaw chucks under 12 inches have solid faces. Three jaw chucks 15 to 24 inch have two slots between the jaws. 27 to 36 inch three jaw chucks have three slots between the jaws. 15 to 36 inch chucks have two slots between the jaws.

Jaws of drop forged steel; thoroughly hardened with raised and ground steps.

Screws of a fine quality of steel, and of liberal diameter with U. S. standard thread.

A set of bolts and nuts is furnished with each Chuck for attaching Chuck to face plate.

The Chuck is provided with a recess in the back, to which a face plate is fitted. We are prepared to furnish when desired rough face plate casting, or make a finished face plate ready to attach to machine.

THREE JAW

NOS.	Size, Inches	Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
12304	4	3 25/32	5 3/8	9	$26.00
12305	5	4 5/8	6 1/2	13	29.00
12306	6	5 5/8	7 5/8	20	33.00
12307	7 1/2	7	9 1/4	29	40.00
12309	9	8 9/16	11 1/4	45	48.00
12310	10 1/2	9 13/16	12 1/2	60	56.00
12312	12	7	14 3/4	85	64.00
12315	15	8 5/8	17 1/2	115	85.00
12318	18	9 13/16	21	190	106.00
12321	21	10 1/2	24	275	134.00
12324	24	13 1/2	27	375	170.00
12328	28	13 1/2	30	550	220.00
12332	32	13 1/2	35	700	300.00

FOUR JAW

12404	4	3 25/32	5 3/8	.....	31.00
12405	5	4 5/8	6 1/2	.....	34.00
12406	6	5 5/8	7 5/8	.....	39.00
12407	7 1/2	7	9 1/4	.....	47.00
12409	9	8 9/16	11 1/4	.....	55.00
12410	10 1/2	9 13/16	12 1/2	.....	63.00
12412	12	7	14 3/4	.....	75.00
12415	15	8 5/8	17 1/2	.....	96.00
12418	18	9 13/16	21	.....	124.00
12421	21	10 1/2	24	.....	152.00
12424	24	13 1/2	27	.....	190.00
12428	28	13 1/2	30	.....	250.00
12432	32	13 1/2	35	.....	350.00

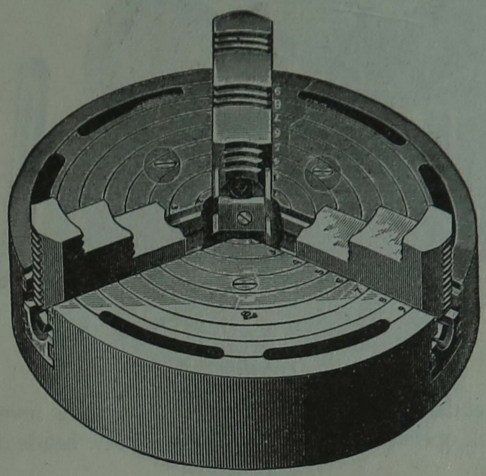


Fig. 909

Provided with independently adjustable jaws which may be set as required for chucking round, elliptical or irregular work, either in a concentric or in an eccentric position, and the Geared Scroll Jaw operating mechanism may be used to grip the work. In tightening by the scroll mechanism universally, it is not necessary to apply the wrench successively in different positions around the Chuck, as any single application will give the full gripping power.

May be operated either as a universal or an independent chuck to hold round eccentric or irregular work.

The end thrust and strain in this Chuck come upon the screw carriers, which interlock with a solid forged steel scroll, thus relieving the body of all strain at the end of the screws.

Jaws are made complete and are hardened before they are fitted to the slot in the body.

THREE JAW

NOS.	Size, Inches	Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
13304	4 9/16	.....	5 7/8	10	$27.00
13306	6	.....	7 5/8	13	33.00
13308	8	3 9/16	10 1/4	29	44.00
13310	10 1/8	5	12 1/2	57	52.00
13313	13 1/4	6	16	105	70.00
13316	16	7 5/8	19	149	90.00
13318	18 1/2	9 3/8	22	190	108.00
13321	21 1/4	9 3/8	26	295	136.00
13324	24	10	30	342	170.00
13327	27	33	33	450	220.00
13330	30	12 7/8	36	535	240.00
13336	36	15	43	760	350.00

FOUR JAW

13404	4 9/16	.....	5 1/8	10	32.00
13406	6	.....	7 5/8	13	39.00
13408	8	3 9/16	10 1/4	29	52.00
13410	10 1/8	5	12 1/4	57	60.00
13413	13 1/4	6	16	105	80.00
13416	16	7 5/8	19	149	105.00
13418	18 1/2	9 3/8	22	190	130.00
13421	21 1/4	9 3/8	26	295	155.00
13424	24	10	30	342	190.00
13427	27	12 7/8	33	450	240.00
13430	30	12 7/8	36	535	300.00
13436	36	15	43	760	400.00

COMBINATION LATHE CHUCKS

SPUR GEARED SCROLL

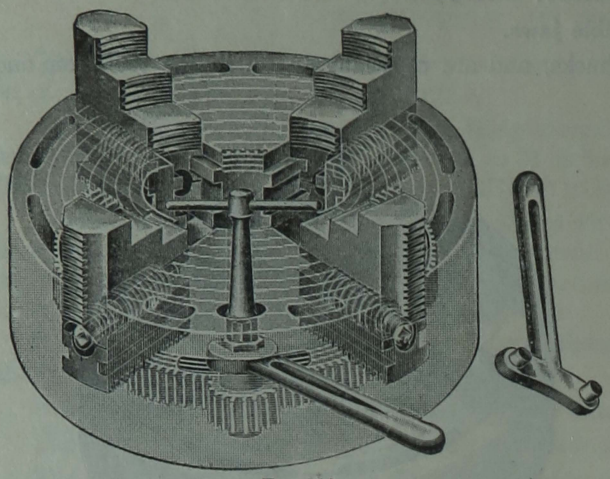


Fig. 910

Independent, universal, eccentric; jaws are reversible and quick operating; for heavy work. Screw heads do not project.

The power applied to produce the universal movement of the jaws is transmitted by a strong spur pinion, which engages with a spur gear cut on the edge of the steel scroll.

The spur pinion is operated by a drop-forged open end wrench, which enters through an opening in the edge of the chuck, and engages with hexagon pinion shaft, and may also be operated from the face of the chuck by a socket wrench, which fits square end of pinion shaft.

The scroll may be rapidly manipulated by a lever engaging directly with it at the back.

Mechanism by which the universal movement of the jaws is produced may be operated from the face and edge of the chuck as well as from the rear.

Jaws are reversible. Body is a finely finished casting ground true.

THREE JAW

NOS.	Size, Inches	Recess Face Plate, Inches	Capacity, Inches	Weight Each, Lbs.	Each
14306	6	.....	7 5/8	13	**$33.00**
14308	8	3 3/16	10 1/4	29	**44.00**
14310	10 1/8	5	12 1/2	57	**52.00**
14313	13 1/4	6	16	105	**70.00**
14316	16	7 5/8	19	151	**90.00**
14318	18 1/2	9 3/8	22	190	**108.00**
14321	21 1/4	9 3/8	26	295	**136.00**
14324	24	10	30	342	**170.00**
14327	27	12 7/8	33	450	**220.00**
14330	30	12 7/8	36	535	**240.00**
14336	36	15	43	760	**350.00**

FOUR JAW

14406	6	.....	7 5/8	13	**$39.00**
14408	8	3 3/16	10 1/4	29	**52.00**
14410	10 1/8	5	12 1/2	57	**60.00**
14413	13 1/4	6	16	105	**80.00**
14416	16	7 5/8	19	157	**105.00**
14418	18 1/2	9 3/8	22	190	**130.00**
14421	21 1/4	9 3/8	26	295	**155.00**
14424	24	10	30	342	**190.00**
14427	27	12 7/8	33	450	**240.00**
14430	30	12 7/8	36	535	**300.00**
14436	36	15	43	760	**400.00**

UNIVERSAL LATHE CHUCKS

SPUR GEARED SCROLL

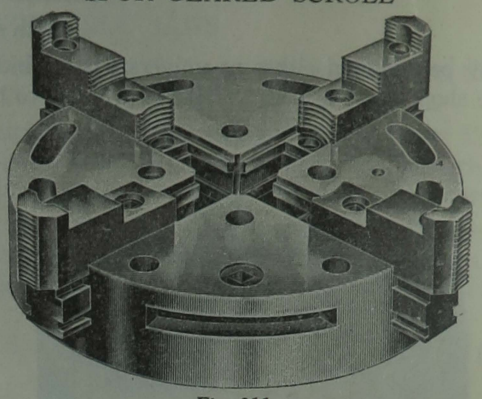


Fig. 911

Designed for manufacturing purposes and for hard service generally, but they can be used also on high speed machines, as they are perfectly balanced. It is strictly a universal chuck, the jaws being moved simultaneously by the scroll threaded plate.

Body is finely finished casting, face ground true to straight edge and parallel to back.

The scroll thread and the curved teeth on jaws are made by special machinery, which not only insures their properly fitting in any position they may be placed, but the wear is reduced to a minimum. The scroll plate and pinion gears of all sizes are made of open-hearth steel. The jaws in the smaller sizes are made of a special crucible steel and the larger jaws are of open hearth steel carefully case hardened.

Jaws are made complete and hardened before being fitted to slots in body.

The spur pinion is operated by a drop-forged open end wrench, which enters through an opening in the edge of the chuck, and engages with hexagon pinion shaft, and may also be operated from the face of the chuck by a socket wrench, which fits square end of pinion shaft.

THREE JAW

NOS.	Size, Inches	Recess Face Plate, Inches	Capacity, Inches	Weight Each, Lbs.	Each
15306	6	.....	7 5/8	13	**$33.00**
15308	8	3 1/2	10 1/4	29	**44.00**
15310	10 1/8	5	12 1/2	57	**52.00**
15313	13 1/4	6	16	105	**70.00**
15316	16	7 9/16	19	105	**90.00**
15318	18 1/2	9 5/16	22	190	**108.00**
15321	21 1/4	9 5/16	26	295	**136.00**
15324	24	10	30	342	**170.00**
15327	27	12 7/8	33	450	**220.00**
15330	30	12 7/8	36	535	**240.00**
15336	36	15	43	760	**350.00**

FOUR JAW

15406	6	.....	7 5/8	13	**$39.00**
15408	8	3 1/2	10 1/4	29	**52.00**
15410	10 1/8	5	12 1/2	57	**60.00**
15413	13 1/4	6	16	105	**80.00**
15416	16	7 9/16	19	149	**105.00**
15418	18 1/2	9 5/16	22	190	**130.00**
15421	21 1/4	9 5/16	26	295	**155.00**
15424	24	10	30	342	**190.00**
15427	27	12 7/8	33	450	**240.00**
15430	30	12 7/8	36	535	**300.00**
15436	36	15	43	760	**400.00**

UNIVERSAL LATHE CHUCKS

GEARED SCROLL—IRON BODY

Jaws are all operated at once moving to and from the center together. This style of chuck has a common center at all times. Jaws are moved simultaneously by a scroll threaded disc or plate. This scroll is revolved by the pinion gears to which the wrench is directly applied. The jaws are made of steel carefully hardened with raised and ground steps and nicely fitted to the chuck body.

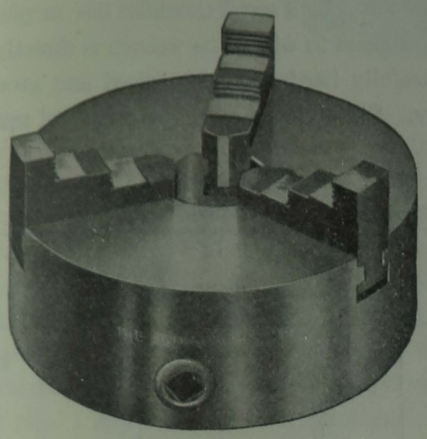


Fig. 912

Not Reversible

Used mostly for lathe work and will hold as large as the diameter of the body.

WITH COMMON JAWS

Style No. 1

NOS.	Size, Inches	Three Jaw		Four Jaw	
		Weight Each, Lbs.	Each	NOS.	Each
16303	3	6	$17.00	16403	$19.00
16304	4	11	19.00	16404	21.00
16305	5	18	21.00	16405	23.00
16306	6	22	24.00	16406	27.00
16307	7½	33	24.00	16407	30.00
16309	9	41	33.00	16409	36.00
16310	10½	46	38.00	16410	42.00
16312	12	52	45.00	16412	50.00
16315	15	96	60.00	16415	65.00
16318	18	124	80.00	16418	87.00
16321	21	252	105.00	16421	115.00
16324	24	342	140.00	16424	150.00

WITH TWO SETS OF JAWS

Style Nos. 1 and 2

Not Reversible

NOS.	Size, Inches	Three Jaw		Four Jaw	
		Weight Each, Lbs.	Each	NOS.	Each
18303	3	6	$20.00	18403	$22.00
18304	4	11	22.00	18404	24.00
18305	5	18	24.00	18405	27.00
18306	6	22	28.00	18406	31.00
18307	7½	33	32.00	18407	36.00
18309	9	41	38.00	18409	42.00
18310	10½	46	44.00	18410	49.00
18312	12	52	52.00	18412	58.00
18315	15	96	70.00	18415	76.00
18318	18	124	92.00	18418	102.00
18321	21	252	120.00	18421	135.00
18324	24	342	155.00	18424	170.00

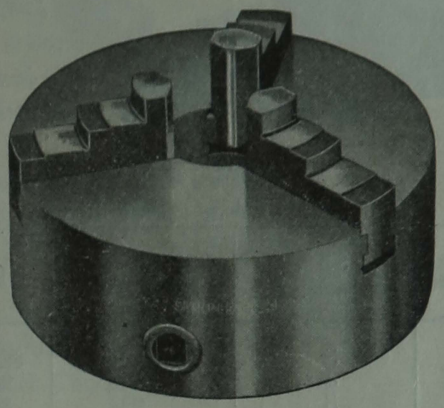


Fig. 913

Not Reversible

Used mostly for shell or cylinder work with jaws inside.

WITH REVERSE JAWS

Style No. 2

NOS.	Size, Inches	Three Jaw		Four Jaw	
		Weight Each, Lbs.	Each	NOS.	Each
17303	3	6	$17.00	17403	$19.00
17304	4	11	19.00	17404	21.00
17305	5	18	21.00	17405	23.00
17306	6	22	24.00	17406	27.00
17307	7½	33	27.00	17407	30.00
17309	9	41	33.00	17409	36.00
17310	10½	46	38.00	17410	42.00
17312	12	52	45.00	17412	50.00
17315	15	96	60.00	17415	65.00
17318	18	124	80.00	17418	87.00
17321	21	252	105.00	17421	115.00
17324	24	342	140.00	17424	150.00

WITH TWO-PIECE REVERSIBLE JAWS

Style J

NOS.	Size, Inches	Three Jaw		Four Jaw	
		Weight Each, Lbs.	Each	NOS.	Each
22303	3	6	$19.00	22403	$21.00
22304	4	11	21.00	22404	23.00
22305	5	18	23.00	22405	25.00
22306	6	22	27.00	22406	30.00
22307	7½	33	30.00	22407	34.00
22309	9	41	36.00	22409	40.00
22310	10½	46	41.00	22410	46.00
22312	12	52	49.00	22412	54.00
22315	15	96	64.00	22415	70.00
22318	18	124	85.00	22418	95.00
22321	21	252	112.00	22421	125.00
22324	24	342	147.00	22424	160.00

UNIVERSAL LATHE CHUCKS

GEARED SCROLL—STEEL BODY

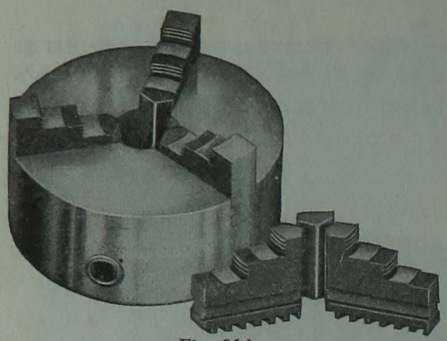


Fig. 914

Designed for general manufacturing purposes. The Steel Body Chucks are made of the best grade of steel and are especially adapted for extra hard service. The design and dimensions of the All Steel Chucks are practically the same as the Iron Body Chucks.

Jaws are moved simultaneously by a scroll threaded disc or plate. This scroll is revolved by the pinion gears to which the wrench is directly applied. The jaws are made of steel carefully hardened with raised and ground steps and fitted to the Chuck Body. Style Nos. 1 and 2 jaws are not reversible.

THREE JAW

With Common Jaws—Style No. 1

NOS.	Size, Inches	Weight Each, Lbs.	Each
19303	3	2½	$24.00
19304	4	6½	27.00
19305	5	9¾	30.00
19306	6	15	34.00
19307	7½	26	38.00
19309	9	36	47.00
19310	10½	48	54.00
19312	12	71	64.00
19315	15	119	85.00
19318	18	141	114.00
19321	21	194	150.00
19324	24	....	200.00

With Reverse Jaws—Style No. 2

NOS.	Size, Inches	Weight Each, Lbs.	Each
20303	3	2½	$24.00
20304	4	6½	27.00
20305	5	9¾	30.00
20306	6	15	34.00
20307	7½	26	38.00
20309	9	36	47.00
20310	10½	48	54.00
20312	12	71	64.00
20315	15	119	85.00
20318	18	141	114.00
20321	21	194	150.00
20324	24	....	200.00

With Two Sets of Jaws—Styles Nos. 1 and 2

NOS.	Size, Inches	Weight Each, Lbs.	Each
21303	3	4	$27.00
21304	4	8	30.00
21305	5	12	33.00
21306	6	21	38.00
21307	7½	33	43.00
21309	9	45	52.00
21310	10	66	60.00
21312	12	77	71.00
21315	15	149	95.00
21318	18	192	126.00
21321	21	224	165.00
21324	24	....	215.00

FOUR JAW

With Common Jaws—Style No. 1

NOS.	Size, Inches	Weight Each, Lbs.	Each
19403	3	2½	$26.00
19404	4	6½	29.00
19405	5	9¾	32.00
19406	6	15	37.00
19407	7½	26	41.00
19409	9	36	50.00
19410	10½	48	58.00
19412	12	71	69.00
19415	15	119	90.00
19418	18	141	121.00
19421	21	194	160.00
19424	24	....	210.00

With Reverse Jaws—Style No. 2

NOS.	Size, Inches	Weight Each, Lbs.	Each
20403	3	2½	$26.00
20404	4	6½	29.00
20405	5	9¾	32.00
20406	6	15	37.00
20407	7½	26	41.00
20409	9	36	50.00
20410	10½	48	58.00
20412	12	71	69.00
20415	15	119	90.00
20418	18	141	121.00
20421	21	194	160.00
20424	24	....	210.00

With Two Sets of Jaws—Styles Nos. 1 and 2

NOS.	Size, Inches	Weight Each, Lbs.	Each
21403	3	4	$29.00
21404	4	8	32.00
21405	5	12	36.00
21406	6	21	41.00
21407	7½	33	47.00
21409	9	45	56.00
21410	10	66	65.00
21412	12	77	77.00
21415	15	149	101.00
21418	18	192	136.00
21421	21	224	180.00
21424	24	....	230.00

UNIVERSAL LATHE CHUCKS

GEARED SCROLL—LIGHT PATTERN—IRON BODY

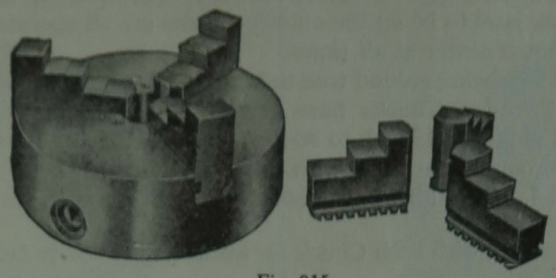


Fig. 915

This line of Light Pattern Universal Chucks is adapted especially for use on light lathes. They are amply strong for this service and are recommended for light and amateur work.

In tightening by the scroll mechanism universally, it is not necessary to apply the wrench successively in different positions around the Chuck, as any single application will give the full gripping power.

The Jaws are made of steel and thoroughly case-hardened, and have raised and ground steps.

The screws are made of a fine quality of steel, are of large diameter with a heavy square thread, are nicely fitted to the bearings, and are threaded the full length, giving a long range of adjustment to the jaws.

Hardened steel thrust bearings for the jaw adjusting screws are furnished in the Iron Body Chucks.

A T-handle steel wrench of suitable proportion is furnished with each Chuck.

Styles Nos. 1 and 2 jaws are not reversible.

THREE JAW

With Common Jaws—Style No. 1

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
24303	3	3	4	
24304	4	4	8	$12.00
24305	5	5	12	16.00
24306	6	6	21	18.00
24307	7½	7½	33	21.00
24309	9	9	45	28.00

With Reverse Jaws—Style No. 2

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
25303	3	3	4	$12.00
25304	4	4	8	14.00
25305	5	5	12	16.00
25306	6	6	21	18.00
25307	7½	7½	33	21.00
25309	9	9	45	28.00

With Two Sets of Jaws—Styles Nos. 1 and 2

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
23303	3	3	4	$14.00
23304	4	4	8	16.50
23305	5	5	12	18.50
23306	6	6	21	21.00
23307	7½	7½	33	24.50
23309	9	9	45	32.00

FOUR JAW

With Common Jaws—Style No. 1

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
24403	3	3	4	$13.50
24404	4	4	8	15.50
24405	5	5	12	17.50
24406	6	6	21	20.00
24407	7½	7½	33	23.00
24409	9	9	45	30.00

With Reverse Jaws—Style No. 2

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
25403	3	3	4	$13.50
25404	4	4	8	15.50
25405	5	5	12	17.50
25406	6	6	21	20.00
25407	7½	7½	33	23.00
25409	9	9	45	30.00

With Two Sets of Jaws—Styles Nos. 1 and 2

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
23403	3	3	4	$16.00
23404	4	4	8	18.50
23405	5	5	12	21.00
23406	6	6	21	23.50
23407	7½	7½	33	27.00
23409	9	9	45	35.00

UNIVERSAL CHUCKS

IRON BODY

For holding work on the steps, jaws to be on the outside. Jaws are all operated at once, moving to and from the center together and having a common center at all times.

Highly finished iron castings; face being ground true to straight edge. The three-jaw Chucks under 12 inches have solid faces. 15-inch to 24-inch three-jaw Chucks have two slots between the jaws. 27-inch to 36-inch three-jaw Chucks have three slots between the jaws. 15-inch to 36-inch four-jaw Chucks have two slots between the jaws.

Jaws of drop forged steel; thoroughly hardened with raised and ground steps.

Screws of a fine quality of steel, and of liberal diameter with U. S. standard thread, insuring the strongest possible gripping power.

A set of bolts and nuts is furnished with each Chuck for attaching Chuck to face plate.

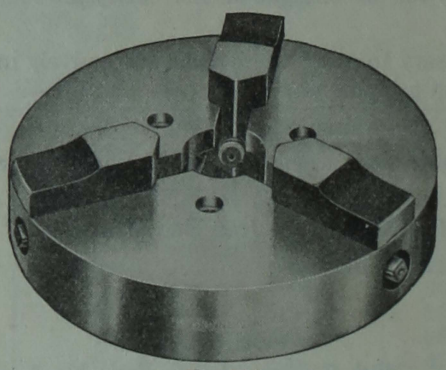


Fig. 916

GEARED SCREW

FOR MILLING MACHINES

THREE JAW

With Style "D" Jaws

Chucks with Style "D" Jaws as shown above are especially adapted for use on Universal Milling Machines. They are also used on screw machines and other hollow spindle machines. The bite on the jaws is below as well as above the jaw screws, thus insuring long and even grip on the work.

Their strength is very great compared with their size, and they are designed for manufacturing purposes and for hard service generally.

The bodies are heavy and strong, and jaw bearings are heavy enough to stand the severe strain of sliding jaws.

The jaws are large and carefully fitted and hardened. The screws are of large diameter with strong square threads.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
10303	3	15/16	4	**$24.00**
10304	4	1 1/8	8	**27.00**
10305	5	1 5/8	12	**30.00**
10306	6	2 3/8	21	**32.00**
10308	8	3	33	**38.00**
10309	9	4 1/4	45	**41.00**
10312	12	6 1/8	66	**49.00**

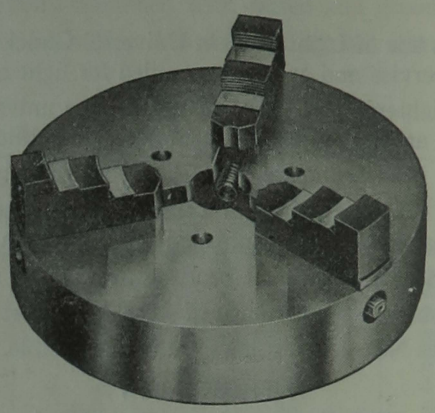


Fig. 917

GEARED SCREW
WITH COMMON JAWS

With Style "A" Jaws—Not reversible

IRON BODY—THREE JAW

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
11303	3	3 5/8	6	**$24.00**
11304	4	4 1/8	11	**27.00**
11305	5	5 1/2	18	**30.00**
11306	6	6 3/8	22	**32.00**
11308	8	8 1/4	33	**38.00**
11309	9	9 1/2	41	**41.00**
11312	12	12 1/4	46	**49.00**
11315	15	16	96	**60.00**
11318	18	19 1/4	124	**75.00**
11321	21	22	252	**96.00**
11324	24	25 1/2	342	**120.00**
11327	27	29 3/4	400	**145.00**
11330	30	32	481	**180.00**
11336	36	37	533	**235.00**
11342	42	42 1/8	631	**300.00**

IRON BODY—FOUR JAW

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
11404	4	4 1/8	6	**$34.00**
11405	5	5 1/2	11	**37.00**
11406	6	6 3/8	18	**39.00**
11408	8	8 1/4	22	**46.00**
11409	9	9 1/2	33	**50.00**
11412	12	12 1/4	41	**59.00**
11415	15	16	46	**72.00**
11418	18	19 1/4	96	**90.00**
11421	21	22	124	**116.00**
11424	24	25 1/2	252	**144.00**
11427	27	29 3/4	400	**177.00**
11430	30	32	481	**220.00**
11436	36	37	533	**296.00**
11442	42	42 1/8	631	**390.00**

TWO JAW CHUCKS
ROUND BODY—WITH SLIP JAWS

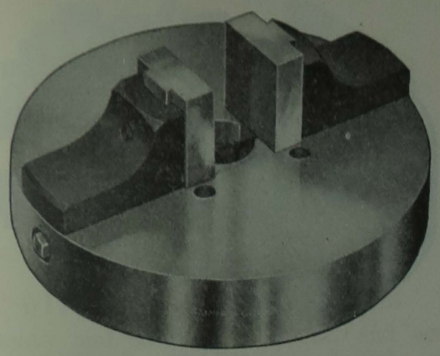


Fig. 918

UNIVERSAL GEARED SCREW

Operated by means of a rack gear and geared pinion screws. The pinion screws are flush with the body of the chuck. Unobstructed centerhole through chuck.

Usually furnished in the universal type, and recommended for holding odd-shaped pieces, which need a bearing all around, and delicate work which would be crushed if gripped in the bite of ordinary chuck jaw. One set of machinery steel slip jaws are furnished with each chuck.

Can be furnished to order, also either independent or combination.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
3204	4	2	8	$22.00
3205	5	4½	12	24.00
3206	6	5	21	26.00
3208	8	6	45	32.00
3209	9	9	60	35.00
3212	12	10	77	45.00
3215	15	12	149	64.00

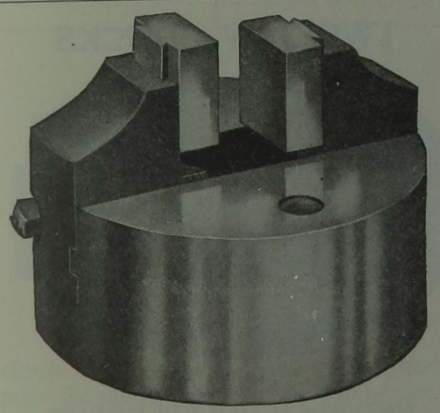


Fig. 919

UNIVERSAL INDEPENDENT

Furnished in universal pattern with adjusting screws at side or in the independent pattern with adjusting screws underneath the jaws. Unobstructed hole through center.

Especially adapted for brass work and for holding soft metal pieces of special shape not hardened.

NOS.	Size, Inches	Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
4204	4½	4⅛	2	10	$20.00
4206	6	5⅝	2½	21	24.00
4201	7	6 11/16	3	33	30.00
4209	9	6 11/16	4	45	35.00
4212	12	9½	6	77	45.00
4215	15	...	...	179	64.00

TWO JAW CHUCKS
BOX BODY—WITH SLIP JAWS

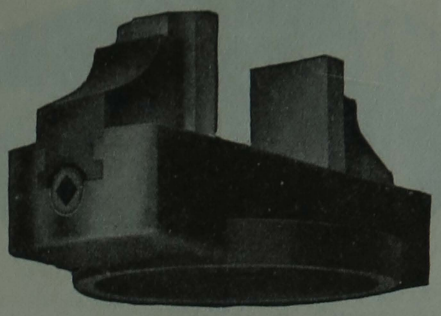


Fig. 920

UNIVERSAL INDEPENDENT

With Face Plate Recess

The universal chuck is operated by right and left hand screw beneath the jaws. Furnished also in independent pattern. One pair of machinery steel slip jaws furnished with each chuck, but tool steel jaws can be substituted or furnished extra.

Regularly furnished with recess for face plate, but chuck with hub for threading to screw on lathe spindle can be furnished if desired.

NOS.	Size, Inches	Face Plate, Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
1207	7	4¾	3	24	$28.00
1209	9	5⅝	4	49	33.00
1212	12	7	6	58	40.00
1215	15	7	8	91	50.00
1218	18	9½	10	120	75.00
1221	21	...	...	.....	100.00
1224	24	...	...	.....	120.00

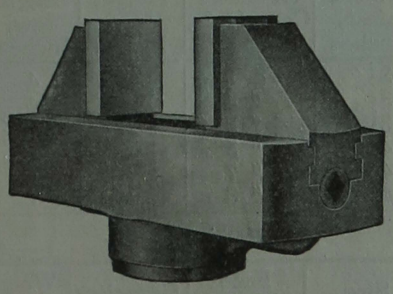


Fig. 921

UNIVERSAL INDEPENDENT

With Hub for Spindle

Similar to chuck shown above but with hub to be threaded to fit spindle of lathe.

NOS.	Size, Inches	Diameter Hub, Inches	Capacity, Inches	Weight Each, Lbs.	List Price, Each
2207	7	3½	3	24	$28.00
2209	9	4⅛	4	49	33.00
2212	12	4⅛	6	58	40.00
2215	15	4½	8	91	50.00
2218	18	4½	10	120	75.00
2221	21	...	...	.....	100.00
2224	24	...	...	.....	120.00

UNIVERSAL CHUCKS

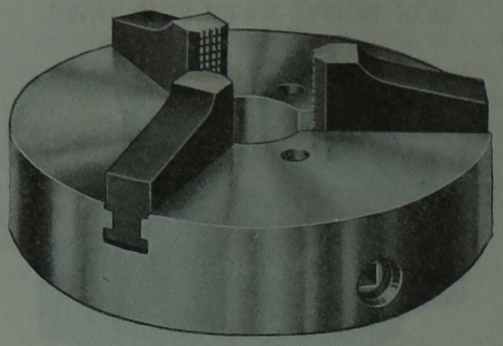


Fig. 922

HEAVY DUTY GEARED SCROLL

For Bar and Forging Work

The bite of the jaws extends not only above but below the face of the chuck and even below the adjusting screw itself. The long bite thus obtained insures a rigid grip of unusual power. The extra large center hole allows the work to be held inside the chuck body and not above the face as in other chucks. This eliminates much of the strain and makes the grip much stronger. Ease of operation coupled with extraordinary strength and general durability are additional features found in this chuck.

In cases where the chucks are not to be used on small work, the center holes can be bored out somewhat, and the capacity of the chuck be correspondingly increased.

In these heavy duty chucks, both the scrolls and pinions are heat-treated and oil-hardened in all the sizes up to and including 18 inches. On the two largest sizes a special treatment of forging is secured before machining the scroll, the pinions, however, being hardened all over.

All bearings are hardened and ground.

The outer end of pinions are of large diameter, giving ample strength for use of long, heavy wrenches. Note the length of wrench handles regularly furnished.

Dimensions

Size, Inches	Thickness, Inches	Diameter Cen. Hole, Inches	Height Jaw, Inches	Length Jaw, Inches	Length Wrench, Inches
10½	3¼	3 or 3½	1⅞	4	12
12	3⅛	3 " 4	1⅞	4	15
15	3 15/16	3½ " 5¼	2⅜	5½	19
18	4⅛	4 " 5¾	2⅜	5½	21
21	4⅝	4½ " 7	2 11/16	7	24
24	4 11/16	5 " 8	2 11/16	7	24

IRON BODY

NOS.	Size, Inches	Face Plate, Inches	Capacity, Inches	Weight Each, Lbs.	Each
27310	10½	7	10½	52	$45.00
27312	12	7	12½	86	54.00
27315	15	8	15¼	156	72.00
27318	18	10	18	200	96.00
27321	21	11	21	330	126.00
27324	24	12	24	410	165.00

STEEL BODY

NOS.	Size, Inches	Face Plate, Inches	Capacity, Inches	Weight Each, Lbs.	Each
28310	10½	7	10½	58	$63.00
28312	12	7	12½	86	75.00
28315	15	8	15¼	156	99.00
28318	18	10	18	183	129.00
28321	21	11	21	330	171.00
28324	24	12	24	430	213.00

UNIVERSAL CHUCKS

GEARED SCREW

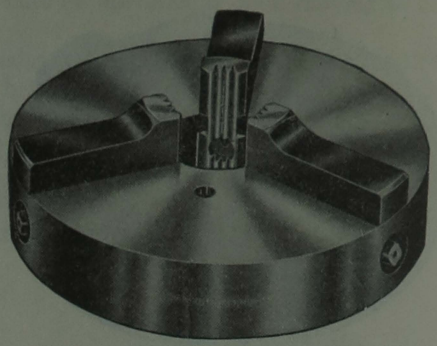


Fig. 923

IRON BODY THREE JAW

With Style "E" Jaws

This is a heavy pattern chuck with large hole through the center. The unusual gripping power together with the long bites on the Jaws and heavy gearing, makes it especially suitable for cutting-off machines, and also for machines handling bars.

NOS.	Size Chuck, Inches	Face Plate Seat Inches	Capacity, Inches	Weight Each, Lbs.	Each
26308	8	4½	8½	38	$34.00
26309	9	5	11	61	38.00
26312	12	7¼	13	79	50.00
26314	14	8 17/32	16½	135	63.00
26317	17	11	20	178	78.00
26320	20	12	23	270	90.00
26324	24	15	27	352	110.00
26330	30	18	33	620	170.00

TWO JAW CHUCKS

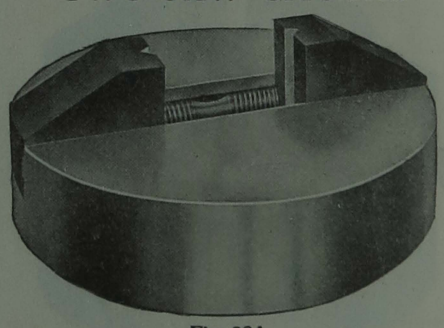


Fig. 924

UNIVERSAL INDEPENDENT

With "V" Groove in Jaws

Right and left hand adjusting screws are at the side in the Universal chuck and beneath the jaws in the Independent chuck, but do not obstruct center hole.

The chucks having a V groove for use on screw machines and for holding bars, rods, drills, square shank tools.

NOS.	Size, Inches	Face Plate Recess, Inches	Capacity, Inches	Weight Each, Lbs.	Each
5204	4½	4⅛	1¼	10	$20.00
5206	6	5⅝	1½	18	24.00
5207	7	6 11/16	2	36	30.00
5209	9	6 11/16	2½	43	35.00
5212	12	9½	3	86	45.00
5215	15	...	...	134	64.00

PLANER CHUCKS

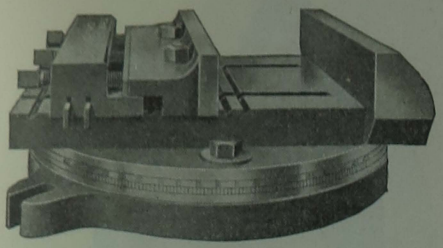


Fig. 925

WITH ROUND SWIVEL BASE

Made heavy and strong throughout, and accurately graduated in degrees. Holds either straight or taper work, and the jaws are so constructed that work will not raise from the bed. The jaws are heavy and will permit of repeated dressing after having become bruised from hard service.

Round Base Chucks have a rib 1¼ inches wide cast on bottom, to fit in planer table. This rib adds to the strength of the Chuck and the machining of the rib is a simple operation.

NOS.	Sizes, Inches	Length Jaw, Inches	Capacity, Inches	Weight Each, Lbs.	Each
806	6	7	3½	77	$32.00
808	8	9	5	95	38.00
810	10	11	6	165	45.00
812	12	13	8	220	54.00
815	15	15½	9½	310	70.00
818	18	18½	11¼	442	90.00
824	24	24¼	16	722	130.00
830	30	30¼	21½	1200	200.00

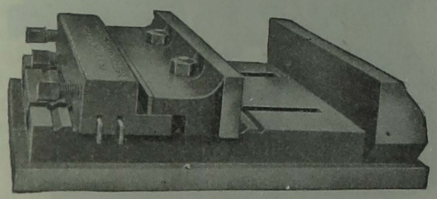


Fig. 926

WITH SQUARE BASE

This chuck is made heavy and strong, and will not spring under the heaviest work. A strip of steel is fitted to the movable jaw to take the thrust of the set screws. All nuts are case hardened, and a forged steel wrench goes with every chuck.

Flange on all sides for clamping to planer tables.

NOS.	Size, Inches	Length Jaw, Inches	Capacity, Inches	Weight Each, Lbs.	Each
906	6	7	3½	55	$22.00
908	8	9	5	68	27.00
910	10	11	6	110	32.00
912	12	13	8	130	38.00
915	15	15½	9½	234	50.00
918	18	18½	11¼	320	64.00
924	24	24¼	16	508	92.00
930	30	30¼	21½	1056	175.00

SHAPER AND PLANER VISES

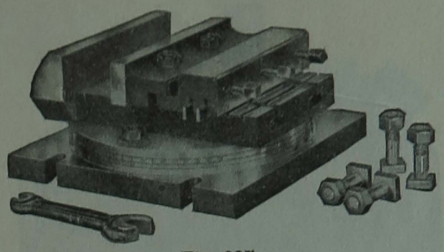


Fig. 927

WITH SQUARE SWIVEL BASE

This vise was designed more especially for use on shapers but will also give good service on planers and milling machines. It is very much stronger than the ordinary shaper vise and in fact is the best tool of its type on the market.

A hardened wrench, four bolts and nuts are furnished with each vise.

One or more ribs are cast on the bottom of the base according to the construction of the table. These can be machined to fit machine table.

In ordering be sure to send sketch showing location of slots in table to which the vise is to be fitted.

NOS.	Size, Inches	Length Jaw, Inches	Capacity, Inches	Weight Each, Lbs.	Each
1006	6	7	3½	77	$48.00
1008	8	9	5	95	57.00
1010	10	11	6	165	67.50
1012	12	13	8	220	81.00
1015	15	15½	9½	300	105.00
1018	18	18½	11¼	442	135.00
1024	24	24¼	16	722	195.00

DRILL PRESS VISES

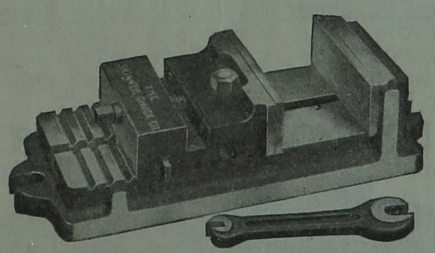


Fig. 928

This Vise is designed for holding work on a drill table. It can also be used to advantage on planers, shapers, milling machines, etc.

Body is carefully machined and highly finished casting, provided with lugs on side so vise may be used at right angles.

Jaws of good proportion with steel faces. "V" grooves can be cut in these jaws for holding round work. Instant adjustment can be made of jaws from 0 to greatest capacity. Either straight or taper work can be held.

Set screw and holding strip of crucible steel, and set screws and nuts hardened.

A case hardened forged steel wrench is furnished with each vise.

Bolted to drill, planer, miller or shaper by ears at both ends of vise. Vise also has flange on all sides for clamping.

NOS.	Size, Inches	Width Jaw, Inches	Capacity, Inches	Weight Each, Lbs.	Each
1102	2½	2½	2½	4¼	$10.00
1103	3½	3½	4¾	12	12.00
1104	4½	4½	5	37	15.00
105	5½	5½	6	43	18.00
1107	7½	7½	9	98	30.00

CAR WHEEL CHUCKS

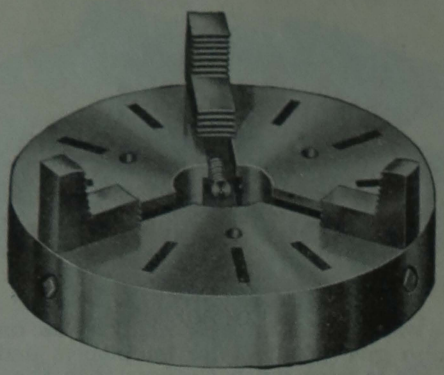


Fig. 929

Car-wheel chucks are made in several different patterns —from 24 inch to 42 inch in diameter—the 36 inch and 42 inch sizes either 3-jaw or 6-jaw. We have furnished chucks for several special car-wheel boring—and grinding—machines and can furnish car-wheel chucks with clamp jaw, etc. The ordinary types can generally be furnished from stock; special forms of car-wheel chucks can be assembled promptly.

NOS.	Size, Inches	No. Jaws	Capacity, Inches	Weight Each, Lbs.	Each
1224	24	3	24	215	$140.00
1226	26	3	26	330	175.00
1230	30	3	30	475	220.00
1236	36	3	36	675	280.00
1236–6	36	6	36	725	390 00
1242	42	3	42	750	350.00
1242–6	42	6	42	825	450.00

BORING MILL CHUCKS

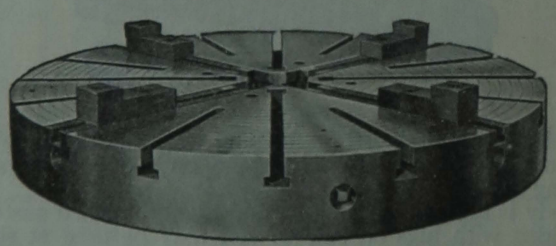


Fig. 930

Made to suit the style of machine on which they are to be placed. Universal scroll chucks with an independent movement of the jaws. All parts are made strong and powerful and designed to prevent excessive wear.

Chucks, Inches	For Mills, Inches	Chucks, Inches	For Mills, Inches	Each
18	Special	36	37	.....
20	Special	37	37	.....
24	Special	38	37	.....
28	Special	40	44	.....
29	30	42	44	.....
30	30	51	52	.....
34	Special	60	62	.....

Prices on Application

GRINDING MACHINE CHUCKS

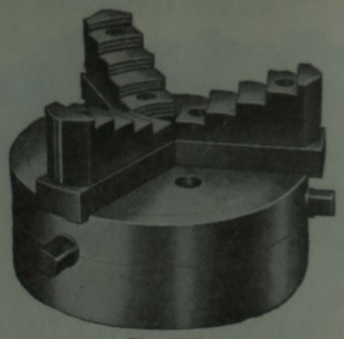


Fig. 931

WITH REVERSIBLE JAWS

This chuck has extra long jaws and an increased number of steps, to give it the greater capacity. It is recommended only for light work.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
1304	4	5	10	$32.00
1305	5	6	21	35.00

WITH NON-REVERSIBLE JAWS

Especially adapted for grinding machines where light work is required.

NOS.	Size, Inches	Capacity, Inches	Weight Each, Lbs.	Each
1503	3	3	8	$17.00
1504	4	4	11	19.00

VALVE CHUCKS

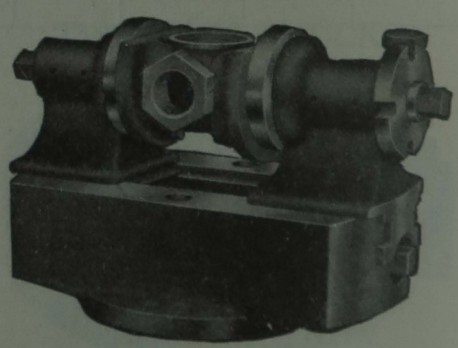


Fig. 932

WITH BALL BEARINGS

The patent valve chuck is a special universal box body chuck. It is fitted with index plates, and jaws of any shape for holding special work can be attached. It is specially designed for holding globe valves, faucets and fittings.

NOS.	Size, Inches	Holds Valves, Inches	Jaws Open, Inches	Diam. Recess, Inches	Distance Face Chuck to Center Disc, Inches	Each
1607	7	½	2½	3¾	1¼	.....
1609	9	1	3	5 1/16	2¼	.....
1612	12	1½	5	7 1/16	3	.....
1615	15	2	7	7 1/16	4½	.....
1618	18	3	9	8½	5⅜	.....
1620	20	3	9	8½	5⅜	.....

Prices on Application

WRENCHLESS CHUCKS

STEEL BODY

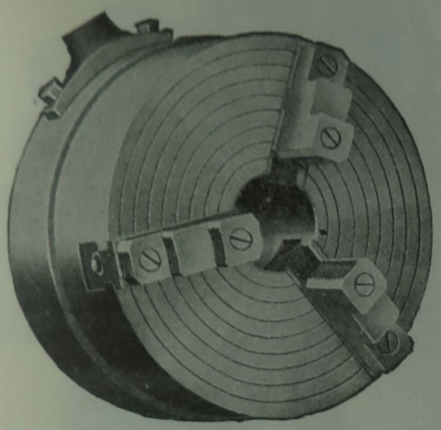


Fig. 933

THREE JAW

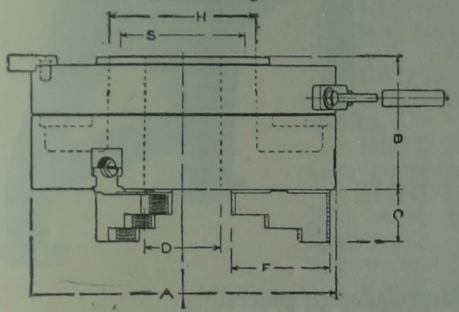


Fig. 934

Rapid chucking is one of the most important elements determining production cost. Small parts by the old style methods frequently require more time to set up than machine, which makes some kind of quick-acting chuck indispensable.

This three-jaw chuck is intended for every class of Screw Machines, Turret, Lathes, or semi-automatic work. They have an excessively powerful grip and will drive the most severe cuts in any kind of material. Other valuable features of this chuck are: Its independent adjustment; universal and self-centering jaw action; work may be inserted or removed while the chuck is in motion; chucking movement of jaw is greater than on any other make of chuck, and the chuck center is open to the diameter of spindle, allowing machining from the bar, or to pilot boring bar inside the hub of chuck for heavy work.

NOS.	Dimensions, Inches				
	A	B	C	D	E
412	6½	4	1¼	1¼	¾
410	8½	4¾	1¾	1½	1¼
400	10¼	6⅛	2½	2	1½
402	12¼	6⅛	2½	3	1½
404	14	6⅜	2¾	4	1⅝
406	16	6½	2⅞	5	1¾
408	18	7	2⅞	6	1¾

NOS.	Dimensions, Inches			Chuck'g Movement, Inches	Weight Each, Lbs.	Each
	F	H	S			
412	2⅜	2⅜	2	⅜	42	.....
410	3⅛	3½	3	⅜	76	.....
400	3¾	4⅛	3¼	⅜	106	.....
402	4	6⅛	5¼	⅜	132	.....
404	4½	7	6	⅜	154	.....
406	5	8½	7½	⅜	218	.....
408	5	10	9	⅜	256	.....

Prices on Application

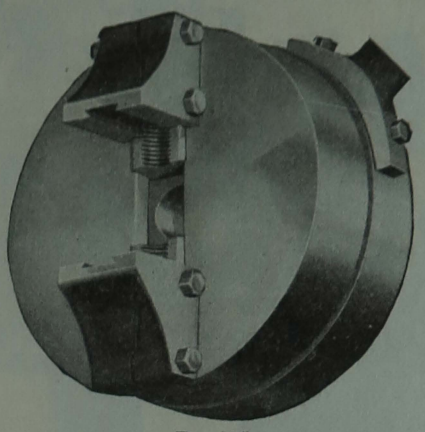


Fig. 935

TWO-JAW

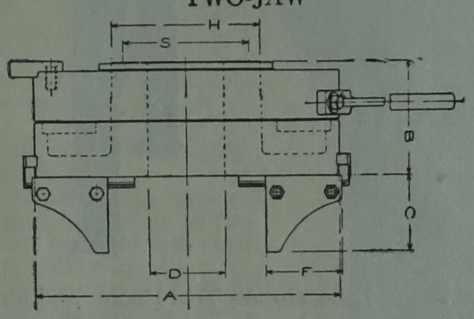


Fig. 936

Constructed in every way similar to the three-jaw type, and has all its points of merit. The two-jaw chuck is intended for irregular shapes, such as forgings, castings, etc., requiring a formed false jaw especially constructed for each operation. The master jaw is provided with dovetail grooves of standard design, with additional clamp bolts to rigidly secure the jaw in permanent position after adjustment. The combined jaw movement of both jaws (which are operated universal and self-centering by the hand lever the chucking distance) are as follows: ¾ Inch on the 6 Inch size to 1¼ Inch on the 16 Inch; the greater portion of this movement is accomplished at the initial movement of the hand lever, leaving about 3/16 Inch of final movement on all the different sizes for intense gripping.

Castings varying ⅛ Inch to 3/16 Inch are readily chucked without resetting the jaws.

NOS.	Dimensions, Inches				
	A	B	C	D	E
413	6½	3⅝	2	1¼	2
411	8½	4¼	2½	1½	2¼
401	10¼	5¼	3	2	2¾
403	12¼	5¼	3	3	2¾
405	14	5¼	3½	3½	3¼
407	16	5¼	3½	4½	3¼

NOS.	Dimensions, Inches			Chuck'g Movement, Inches	Weight Each, Lbs.	Each
	F	H	S			
413	1⅞	2⅜	2	¾	36	.....
411	2½	3½	3	¾	78	.....
401	3	4⅛	3¼	⅞	92	.....
403	3	6⅛	5¼	1	125	.....
405	3½	7	6	1⅛	156	.....
407	3½	8⅛	7½	1¼	195	.....

Prices on Application

SCREW CUTTING ENGINE LATHES

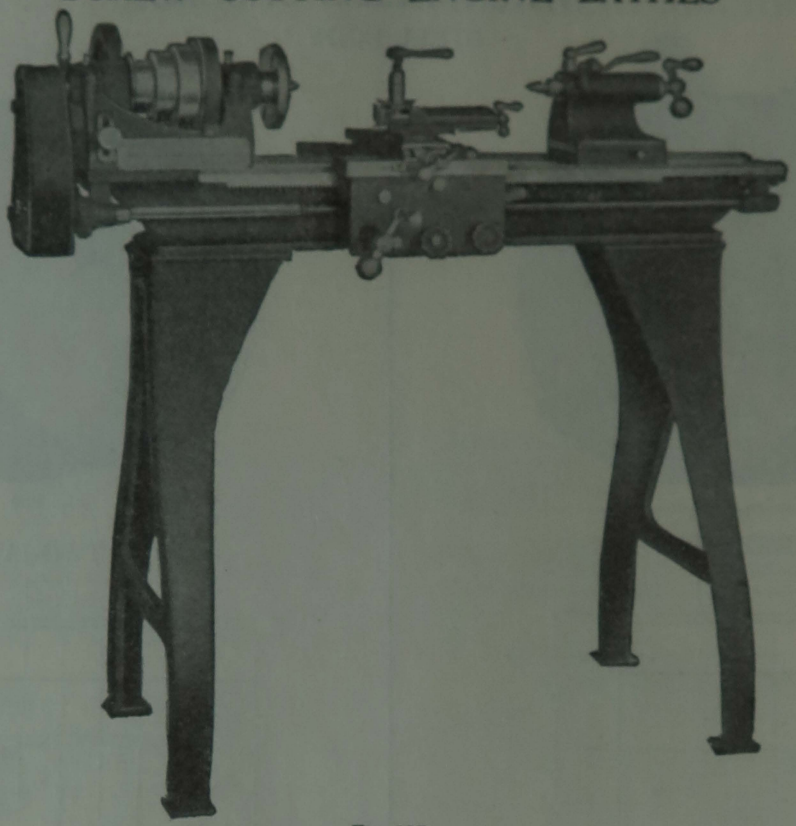


Fig. 937

For Use in Laboratories, Tool Rooms and for Light Actual Commercial work generally.

HEAD-STOCK: is web pattern with hollow spindle.

TAIL-STOCK: grooved, offset pattern with long bearing on bed and base and side adjustment for Taper Turning.

CARRIAGE: Has substantial bearing on ways and is gibbed front and rear, a cross feed screw is supplied with a micrometer collar graduated to read a thousandth of an inch and secured by friction spring, and readily set to any position. Taper adjustments, which can be fixed at any time.

RESTS: Both plain and compound, are interchangeable, one cross-slide tool post answering for both rests; plain rest is furnished with all lathes, and compound rest may be ordered with lathe or at any future time.

FEEDS: Improved power across and longitudinal feeds are actuated by phosphor bronze worm, receiving power from Head Spindle through spur gears and lead screw, which is splined and acts as a feed rod.

SCREW CUTTING: Has extremely wide range, cutting right and left, standard threads from 3 to 72 per inch, including 11½ and 27. Transposing gears and index for cutting international metric thread from 0.5 mm. to 8 mm. can be furnished.

COUNTERSHAFT: Has improved clutch pulleys: hangers for large ring shaft oil bearings are adjustable for alignment; quick action cone belt shifter. Each lathe is regularly furnished with large and small face plates, center rests, follow rests, 2 point centers hardened and ground, center oiler, full set of change gears and drop forged tool post wrench.

Specifications

Swing over bed, actual	10⅛ in.	Diameter of tail spindle	1⅛ in.
Swing over carriage	5⅞ in.	Travel of tail spindle	2¾ in.
Hole through head spindle	⅞ in.	Length of carriage on bed	10⅜ in.
Diameter spindle nose	1 7/16 in.	Compound rest travels	3 5/16 in.
Threads on spindle nose	12 per inch	Size of lathe tools	⅝ x ¾ in.
Front bearing of spindle	1 7/16x2¾ in.	Cuts threads per inch	3 to 72
Back bearing of spindle	1 5/16x1¾ in.	Capacity of center rest	3 in.
Cone pulley diameters	3 3/16, 4 5/16, 5 5/16 ins.	Size of pulleys on countershaft	6 x 1¾ in.
Width of belt	1¼ in.	Speed of countershaft	175
Ratio of back gearing	7 to 1	Speeds of head spindle	18 to 340
Taper of centers	No. 2 Morse		

NOS.	Rated Swing and Length of Bed	Actual Swing Over Bed, Ins.	Distance Between Centers, Ins.	Floor Space Over All, Ins.	*Style E With Long Legs and Countershaft		Style H With Oil Pan and Countershaft		Style K With Bench Legs and Countershaft		Style P with Foot-Power	
					Net Weight, Lbs.	Cubic Feet of Boxes	Net Weight, Lbs.	Cubic Feet of Boxes	Net Weight, Lbs.	Cubic Feet of Boxes	Net Weight, Lbs.	Cubic Feet of Boxes
10	9 in. x 4 ft.	10⅛	24	25x55½	405	16	455	18	340	12	470	10
20	9 in. x 5 ft.	10⅛	36	25x67½	435	18	495	21	370	14	505	20

*Illustrated above. Prices on Application

TOOL ROOM LATHES

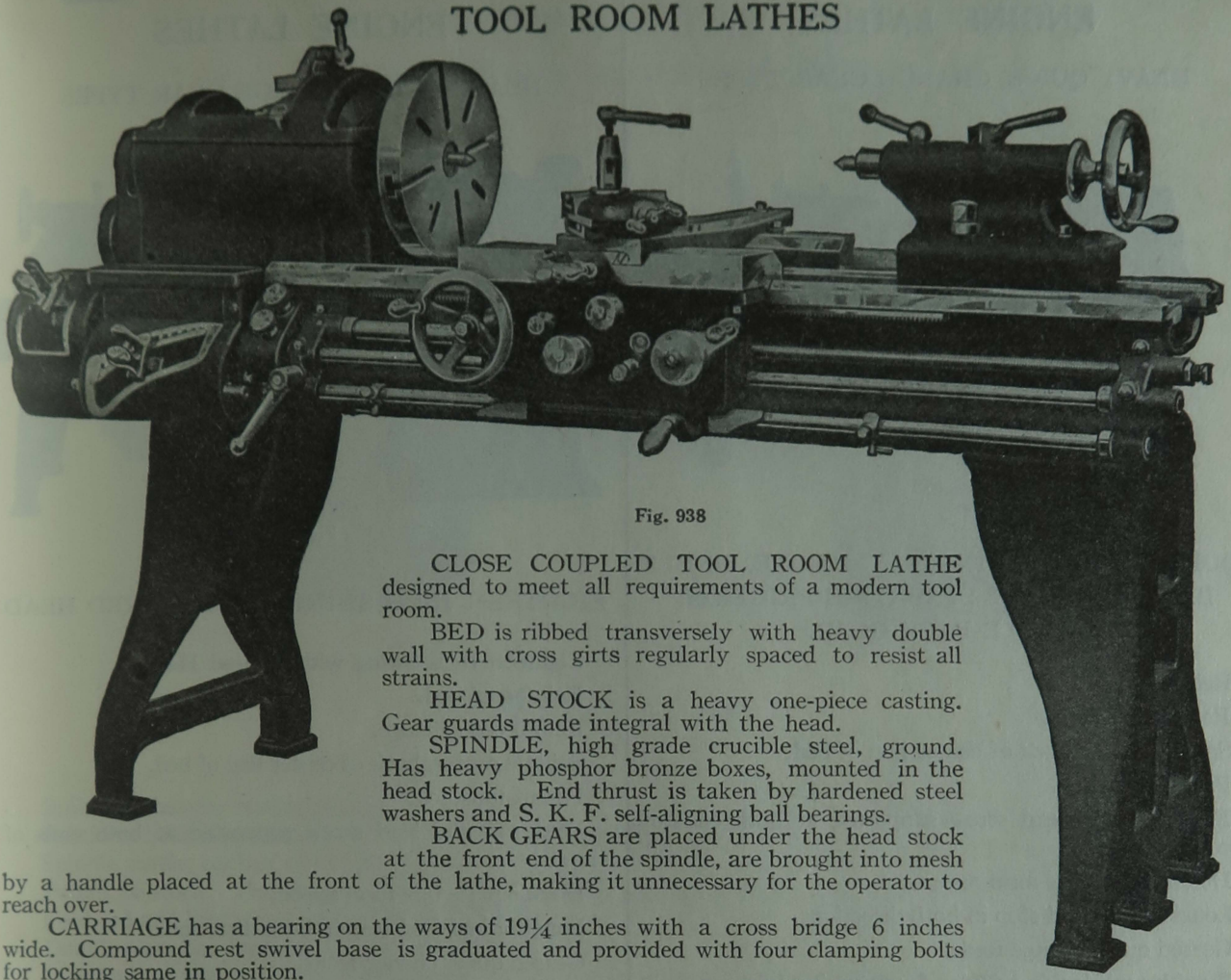


Fig. 938

CLOSE COUPLED TOOL ROOM LATHE designed to meet all requirements of a modern tool room.

BED is ribbed transversely with heavy double wall with cross girts regularly spaced to resist all strains.

HEAD STOCK is a heavy one-piece casting. Gear guards made integral with the head.

SPINDLE, high grade crucible steel, ground. Has heavy phosphor bronze boxes, mounted in the head stock. End thrust is taken by hardened steel washers and S. K. F. self-aligning ball bearings.

BACK GEARS are placed under the head stock at the front end of the spindle, are brought into mesh by a handle placed at the front of the lathe, making it unnecessary for the operator to reach over.

CARRIAGE has a bearing on the ways of 19¼ inches with a cross bridge 6 inches wide. Compound rest swivel base is graduated and provided with four clamping bolts for locking same in position.

APRON is double plate type with two bearing supports for all shafts. A central oil pocket is arranged to lubricate all bearings from one point. Longitudinal and cross feeds are controlled from apron and both can be instantly released under heaviest cuts.

FEEDS are obtained through an independent feed rod and the quick change gear box, without the use of lead screw. They are 36 in number and vary from 4½ to 240.

SCREW CUTTING provides for a range of threads from 1½ to 80 per inch, including 11½, instantly obtained through the quick change gear box. Thirty-six leads regularly supplied, but others can be cut by changing gears on the quadrant.

QUICK CHANGE GEAR BOX is assembled complete and forms a unit in itself.

CARRIAGE REVERSE MECHANISM is operated by lever, placed at right hand of apron, which controls a sliding clutch under head stock giving right or left hand travel to the carriage through a set of accurately planed bevel gears.

AUTOMATIC STOP FOR CARRIAGE is obtained through same rod that operates reverse mechanism. Adjustable collars permit lathe to be used for duplicate or shoulder work.

TAIL STOCK is cut away on one side to permit compound rest to be set parallel with bed.

ALIGNMENT. To provide correct alignment a foot has been placed in the center of the right leg which carries the lathe on a three point support. This assures the lathe being free from strains due to bolting, or setting on an uneven floor, and is a patented feature.

REGULAR EQUIPMENT, upon which base price is determined, consists of a 6-foot bed, large and small face plates, compound and steady rests, one set of round centers, double friction countershaft and necessary wrenches.

MOTOR DRIVE can be furnished provided same is specified when placing order.

Specifications

Swings over Bed	14¼″	Size of tool	½″x1¼″
Swings over Carriage	8¼″	Diameter of Tail Stock Spindle	1⅝″
Takes between Centers, for 6′-0″ Bed	33⅞″	Travel of Tail Stock Spindle	6 9/16″
Hole in Spindle	1½″	Cut Threads	1½ to 80
Front Bearing	3.02″x4 1/16″	Capacity of Center Rest	3⅝″
Rear Bearing	3.09″x2 31/32″	Countershaft Pulleys	10″x3¾″
Centers, Davis-Morse	No. 4	Countershaft Speeds, forward and reverse	200 and 300 R.P.M.
Cone Diameters	4″ to 9″	Floor Space	28″x6′
Width of Face	2⅛″	Net Weight	1615 Lbs.
Ratio Back Gears	8 to 1	Gross weight Boxed for Export	2000 Lbs.
Nose Spindle, Diameter	2⅜″	Size of Box for Export	34x34x83
No. Threads	6		

Prices on Application

ENGINE LATHES

HEAVY QUICK CHANGE GEAR TYPES

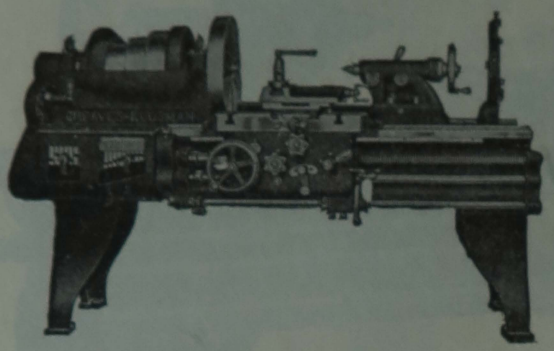


Fig. 939

FOURTEEN INCH SWING, 4 STEP CONE, SINGLE BACK GEAR OR 3 STEP CONE FRICTION, DOUBLE BACK GEAR.

Reinforced bed.

Reinforced carriage.

Spindle center back of center line of bed.

Patent tailstock.

Feed rod and lead screw supported at both ends of apron.

Double plate box form apron.

Longitudinal feed stop in both directions.

Geared quick change feeds.

Tumbler self-locking device for reversing lead screw.

Steel friction gears in apron with cast iron friction bolted on.

Specifications	14″x6′
Length of Bed	6′ 4¾″
Swing over Ways	16½″
Swing over Carriage	10⅝″
Takes between Centers	37¾″
Front Sp. Bg. D-L	2⅝″x3½″
Rear Sp. Bg. D-L	1 15/16″x2⅛″
Hole through Spindle	1¼″
Taper of Centers—Morse	No. 3
Spindle Nose D-L	2¼x1⅛″
Spindle Nose Threads—U. S. S.	6
Width Belt S. B. G.	2½″
Width Belt D. B. G.	2¾″
Range of Threads	2 to 56
Range of Feeds	.0066 to .188
Compound Rest—Travel	2½″
Weight—Crated	1700
Weight Bed per extra Foot	80

Prices on Application

ENGINE LATHES

HEAVY QUICK CHANGE GEAR TYPES

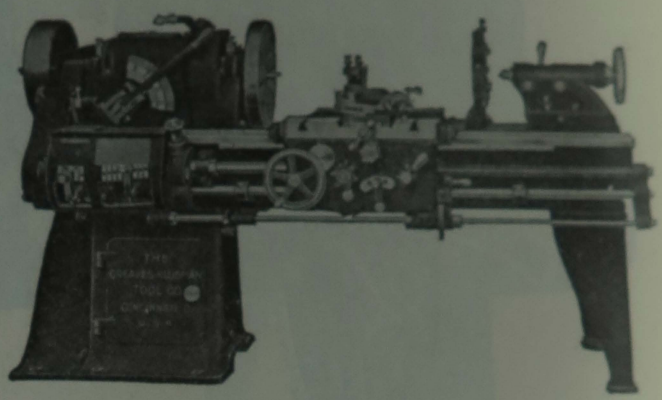


Fig. 940

EIGHTEEN INCH SWING WITH GEARED HEAD

Eighteen Inch Swing with Geared Head.

Reinforced bed.

Reinforced carriage.

Spindle center, back of center line of bed.

Patent tailstock.

Feed rod and lead screw supported at both ends of apron.

Double plate box form apron.

Longitudinal feed stop in both directions.

Geared quick change feeds.

Tumbler self-locking device for reversing lead screw.

Steel friction gears in apron with cast iron frictions bolted on.

Single lever speed control.

Hardened heat-treated transmission gears.

Specifications	16″x6′	18″x6′
Length of Bed	6′ 7″	6′ 7″
Swing over Ways	18½″	20½″
Swing over Carriage	13½″	15¾″
Takes between Centers	36″	31″
Front Sp. Bg. D-L	3¼″x4 11/16″	3 9/16″x5⅛″
Rear Sp. Bg. D-L	2 3/16″x3¾″	2⅝″x4⅝″
Hole through Spindle	1 17/32″	1 17/32″
Taper of Centers—Morse	No. 4	No. 4
Spindle Nose D-L	3″x1½″	3″x1½″
Spindle Nose Threads U.S.S.	5	5
Range of Threads	2 to 56	2 to 56
Range of Feeds	.0061 to .188	.0061 to .188
Compound Rest—Travel	4″	5½″
Weight—Crated	2750	3400
Weight Bed per extra Foot	120	140

Prices on Application

ENGINE LATHES

QUICK CHANGE GEARED HEAD TYPE

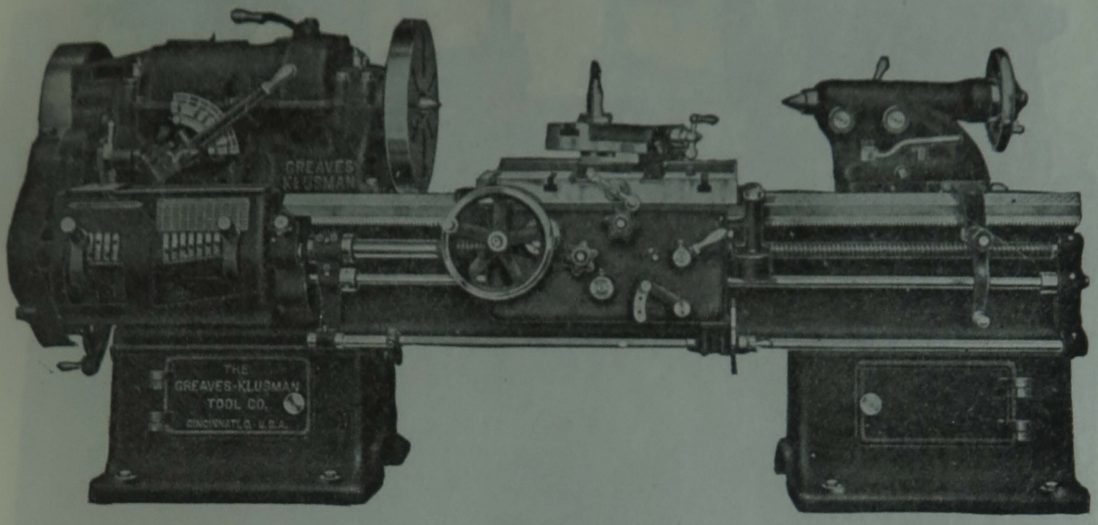


Fig. 941

24 AND 30 INCH SWING

Built with heavily reinforced bed.

Reinforced carriage. Indicator dial is provided for chasing.

Spindle center, back of center line of bed.

Patent tailstock. Permits swiveling of the compound rest 90 degrees on short work.

Feed rod and lead screw supported at both ends of apron.

Double plate box form apron.

Longitudinal feed stop in both directions.

Geared quick change feeds. Gear box is a complete unit in itself and eliminates the necessity of any feed gearing under the head.

Tumbler self-locking device for reversing lead screw.

Steel friction gears in apron with cast iron frictions bolted on.

Single lever speed control.

Hardened heat-treated transmission gears.

The transmission of power is entirely through sliding gears and positive clutches.

The head is extremely rigid, as all the power transmitting mechanism is contained in the head casting proper. The upper half serves only as a cover and is very easily swung back, exposing the entire mechanism of the head for inspection or repairs.

For heavy cutting the power is transmitted to the spindle through the large spindle driving gear, placed immediately behind the front spindle bearing. This relieves the spindle of any undue torsional or bending strains, greatly prolongs ts life and alignment, and eliminates the possibility of chatter.

Specifications	24″x10′	30″x10′
Length of Bed	10′ 8″	10′ 8″
Swing over Ways	27½″	33½″
Swing over Carriage	17¾″	23½″
Takes between Centers	4′ 10″	4′ 10″
Front Sp. Bg. D-L	4 13/16″x8″	4 13/16″x8′
Rear Sp. Bg. D-L	3¾″x5⅝″	3¾″x5⅝″
Hole through Spindle	2⅛″	2⅛″
Taper of Centers—Morse	No. 5	No. 5
Spindle Nose D-L	4″x2⅜″	4″x2⅜″
Spindle Nose Threads U. S. S.	4	4
Range of Threads	½ to 28	½ to 28
Range of Feeds	.0039 to .222	.0039 to .222
Compound Rest—Travel	8″	8″
Weight—Crated	10450 Lbs.	11250 Lbs.
Weight Bed per extra foot	325 Lbs.	325 Lbs.

Prices on Application

ENGINE LATHES

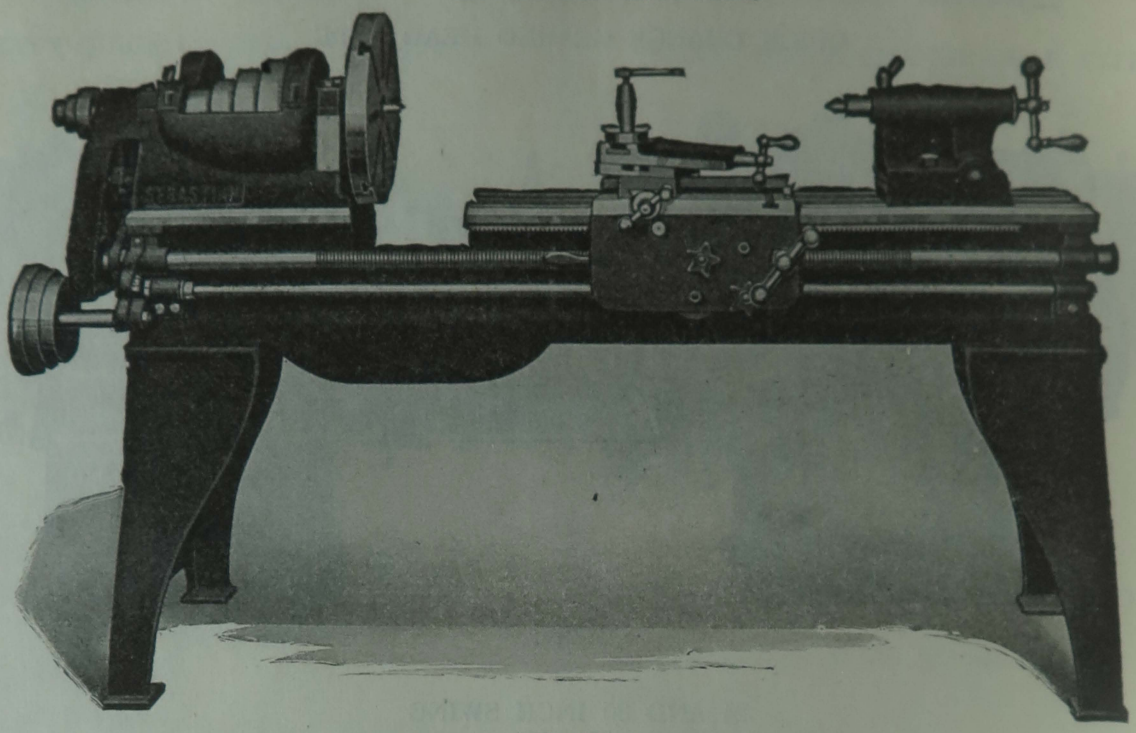


Fig. 942

THIRTEEN AND FIFTEEN-INCH SWING; WITH GAP, TWENTY AND TWENTY-TWO-INCH SWING

THESE TWO SIZES of lathes are all of the same general design. The workmanship and materials are of the very finest throughout. Each lathe is tested and must come up to a certain high standard which is set for them at the works.

The HEAD STOCK of each lathe is amply heavy and well braced. It has a 4-step cone for 2-inch belt. THIS LATHE CAN ALSO BE ARRANGED WITH A THREE-STEP CONE FOR 2½ INCH BELT AT THE SAME PRICE.

The LIVE SPINDLE is made of 40 to 60 point carbon steel accurately ground and with the boxes of a special bearing metal.

The TAILSTOCK has an adjustable side movement for taper turning and is designed so that the Compound Rest will swing at right angles.

The CARRIAGE is of the most approved design, has long bearings on the ways and is provided with ample lubricating devices. It is gibbed to the bed both front and back, and T-slotted.

Lathes can be arranged with Metric Lead Screw and Half Nut instead of regular United States thread when ordered, at the same price.

A special set of Gears and Yoke for Metric Thread Cutting can be furnished which can be attached to lathe instead of regular Gears and Yoke, making it possible to cut both United States and Metric Threads on same lathe.

These lathes are provided with both screw and rod feed as well as with power cross feed, the latter being graduated.

A COMPOUND REST which is GRADUATED is regularly furnished, steady rest, large and small face plates and friction countershaft. A plain Rest can be furnished if it is desired. The usual Lathe Attachments can be furnished.

Either of these lathes are built with a GAP BED as shown in cut without extra charge. The Gap is 7¾ inches long and 3½ inches deep thus increasing the swing of the lathe in Gap 7 inches. The Bed is so braced at the Gap that it is just as strong as at any other point. The Carriage will run over and connect on opposite side of Gap without letting down.

A BRIDGE which is easily and quickly placed in position in gap or removed, may be fitted in the Gap at a small extra charge, but this BRIDGE cannot be fitted after the lathe is finished.

Specifications

	13″	15″
Swings over Bed	13″	15″
Swings over Carriage	7½″	9½″
Length of Bed	6′ to 12′	6′ to 12′
Takes between Centers (6′ bed)	40″	40″
Front Bearings	2 3/16x3½″	2 3/16x3½″
Hole through Spindle	1 5/16″	1 5/16″
Size of Tools	½x1″	½x1″
Ratio of Back Gearing	7½ to 1	7½ to 1

	13″	15″
Diameter of Tail Spindle	1 9/16″	1 9/16″
Compound Rest Travels	4¼″	4¼″
Capacity of Center Rest	3½″	3½″
Centers, Morse Taper	No. 3	No. 3
Width of Driving Belt	2″	2″
Countershaft Pulleys	9″x3″	9″x3″
Speed of Countershaft Pulleys R. P. M.	190	190
Weight, Crated	1300 Lbs.	1350 Lbs.

Prices on Application

Note.—The following pages show a few of the MACHINE TOOLS handled by our Machine Tool Division: Full specifications and illustrations cheerfully furnished on request.

We carry a full line of Machine Tools of various types for immediate shipment.

ENGINE LATHES

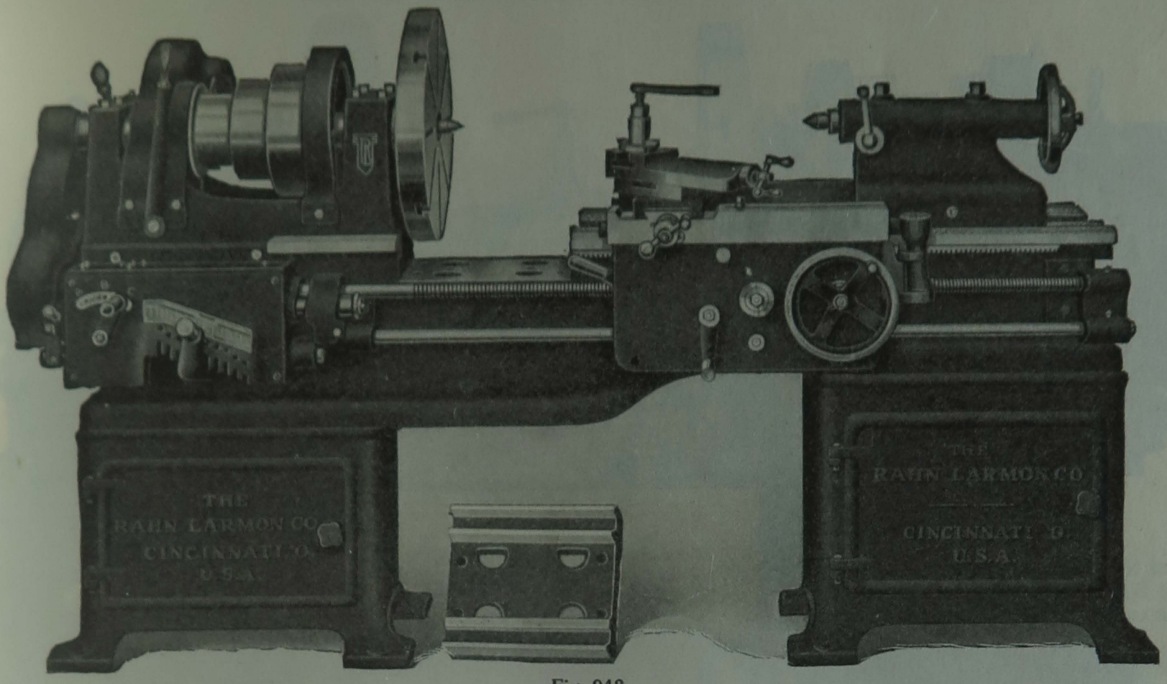


Fig. 943

16-23, 18-25, 20-26-INCH SWING

THESE GAP LATHES have been designed to fully meet the requirements of modern machine shop practice.

They are especially adapted for repair shops, or wherever there is a large range and variety of work to be done accurately and expeditiously, with the least possible expenditure for tools. When the gap is open, as shown in the above cut, large diameters, such as flywheels, pulleys and flanges, can be worked upon within the range of the gap quite as satisfactorily as on a lathe of much larger proportions. An extra piece is furnished to fit into the gap when the full swing of the gap is not desired, as shown in the cut below, thus giving the carriage a full bearing on the V's of the lathe when work is being operated upon close to the head-stock.

BED is very heavy and of deep section, and firmly braced its entire length with box girders. The section of the bed where the gap is cut out is well re-enforced.

HEAD-STOCK is well ribbed and firmly bolted to the bed. The spindle is hollow and ground perfectly cylindrical. The centers are No. 4 Morse taper. The boxes are made of the best gun metal and are provided with means for taking up the wear. The driving cone is of extra large diameter, powerfully back-geared, capable of using a broad belt, and can be furnished with either single or double back gear, three, four or five-step cone.

TAIL-STOCK is of the offset type, which allows the Compound Rest to be placed parallel to the bed. It is also provided with set-over screws for taper work.

CARRIAGE is gibbed to the bed both front and back, and provides a broad bearing for the rest.

COMPOUND REST is very rigid and has a long, broad bearing on the carriage and is provided with taper gibs for taking up the wear.

APRON is of the most simple and effective design, all the feeds being convenient to the hands of the operator.

THREAD CUTTING AND CUTTING FEEDS. The quick change screw cutting and feeding mechanism is of very simple and substantial construction. Entire range of thirty changes both for screw cutting and feeding, is obtained by shifting of only two levers, and can be made instantly while the lathe is running. The gearing on the end of head-stock is so arranged that metric or special threads can be cut by the substitution of different gears. Screw chasing dials are furnished on all lathes of this Series, which obviate the necessity of reversing the spindle when chasing threads. All gears are properly guarded.

COUNTERSHAFT has double friction clutch pulleys of very powerful design. Ample oiling facilities are provided and the shaft runs in self-oiling boxes.

REGULAR EQUIPMENT. Parts furnished regularly with each lathe consist of Countershaft, Steady Rest, Follow Rest, Large and Small Face Plates, Wrenches and Screw Chasing Dial.

EXTRAS. When desired, these lathes can be furnished, at an extra cost, with Taper Attachment, Turret on Carriage, Turret on Bed, Chucks, Chuck Plates, Turning Tools or any special Tool Rest.

When desired, these lathes can be equipped with Quick Change Gear Device.

As there is a demand for lathes on which United States Standard and Metric Threads can be cut, translating gears have been designed which can be used either on Standard or Quick Change Gear Lathes.

Specifications

16-Inch Gap Lathe		18-Inch Gap Lathe		20-Inch Gap Lathe	
Swings over V's	18 inches	Swings over V's	20 inches	Swings over V's	21½ inches
Swings over Gap	23 inches	Swings over Gap	25 inches	Swings over Gap	26 inches
Width of Gap	14 inches	Width of Gap	14 inches	Width of Gap	14 inches

Prices on Application

ENGINE LATHES

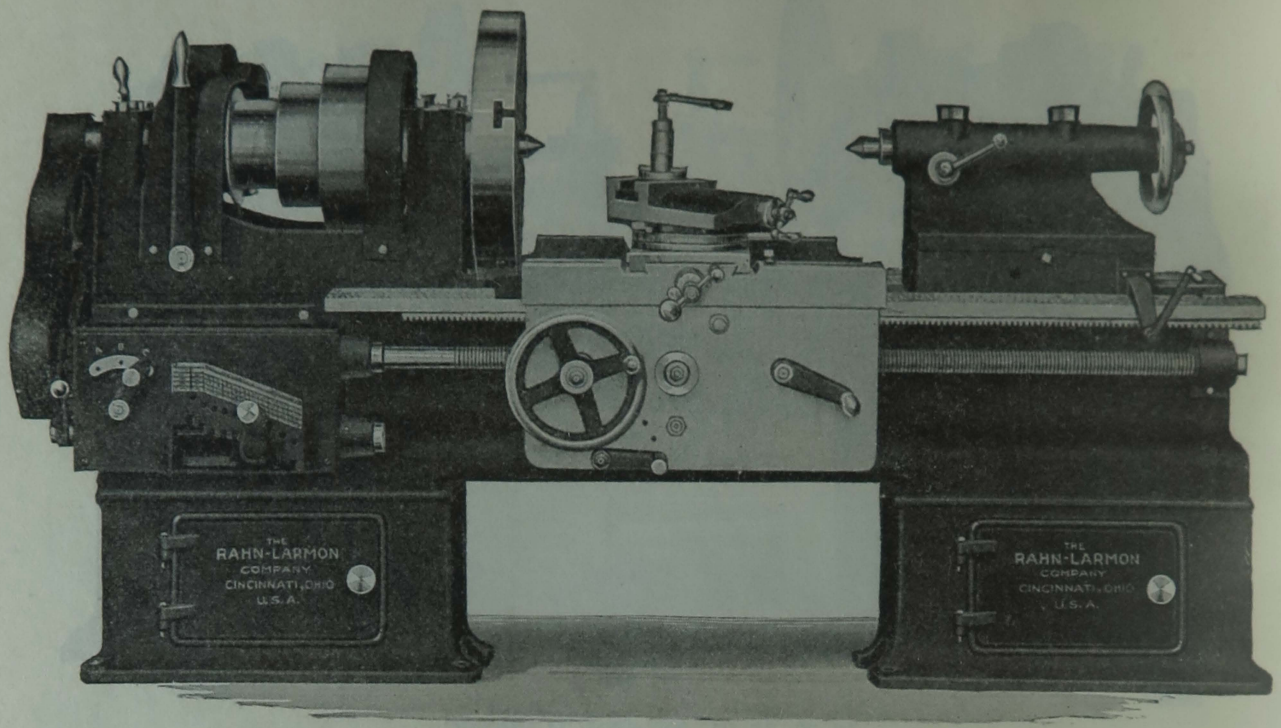


Fig. 944

26-INCH SWING

Designed and constructed for the use of modern high speed steel.

BED is very heavy and of deep section; absorbs the vibration of the heaviest cut.

HEAD-STOCK is well ribbed and firmly bolted to the bed. The spindle is hollow and made of a special high grade carbon steel, ground perfectly cylindrical. The centers are No. 5 Special Morse taper, hardened and ground to run perfectly true. The boxes are made of the best gun metal and are provided with means for taking up the wear. The driving cone is of extra large diameter, powerfully back-geared and capable of using a broad belt.

TAIL-STOCK is of the off-set type which allows the Compound Rest to be placed parallel to the bed.

CARRIAGE is gibbed to the bed both front and back and provides a broad bearing for the rest. It has a long, continuous bearing on the bed and can be firmly locked to it for cross feed work.

COMPOUND REST is very rigid and has a long, broad bearing on the carriage. The gibs are provided with means for taking up the wear and the swivel section is graduated.

APRON is of the most simple and effective design, all the feeds being convenient to the hands of the operator. The rack and all the gears are made of steel and the stud pins are hardened and ground.

THREAD CUTTING AND CUTTING FEEDS. Entire range of thirty changes both for screw cutting and feeding is obtained by shifting of only two levers, and can be made instantly while the lathe is running. The gearing on the end of head-stock is so arranged that metric or special threads can be cut by the substitution of different gears. All gears are properly guarded.

COUNTERSHAFT has double friction clutch pulleys of very powerful design. Ample oiling facilities are provided and the shaft runs in self-oiling boxes.

REGULAR EQUIPMENT. Parts furnished regularly with each lathe consist of Countershaft, Steady Rest, Follow Rest, Full Swing Rest, Large and Small Face Plates, and Wrenches.

EXTRAS. When desired, these lathes (at an extra cost) can be furnished with Taper Attachment, Turret on Carriage, Turret on Bed, Chucks, Chuck Plates, Turning Tools or any special Tool Rest.

Specifications

Front Bearing	4⅜″ diameter x 7¼″ long
Back Bearing	3⅛″ diameter x 5″ long
Hole through Spindle	2⅛″
Diameter Tail Spindle	2⅞″
Traverse Tail Spindle	9¾″
Cone Diameters	10″, 13″, 16″
Width of Belt	4″
Ratio of First Back Gear	4.75 to 1
Ratio of Second Back Gear	12 to 1
Cuts Threads per Inch	2 to 20
Threads on Lead Screw	4 per Inch
Range of Feed	.01″ to .27″
Length of Bed	10′ 6″ and up, in even lengths
Takes between Centers, extreme	5′
Depth of Bed	16½″

Swings over V's	27″
Swings over carriage	19″
Swings over Rest	17¾″
Length of Carriage	34″
Compound Rest Travel	7½″
Size of Tools	¾″x1½″
Countershaft Pulleys	14″x4½″
Speed of Countershaft	125 R.P.M.
Floor Space, 10′ lathe	2′x10′ 6″
Weight, 10′ lathe	5700 Lbs.
Weight Additional 2′	400 Lbs.
Weight, 10′ lathe boxed	6500 Lbs.
Weight additional 2′ Boxed	550 Lbs.
Size of box, 10′ lathe	3′ 8″x3′ 9″x12′ or 165 cubic feet

Prices on Application

EXTENSION BED GAP LATHES

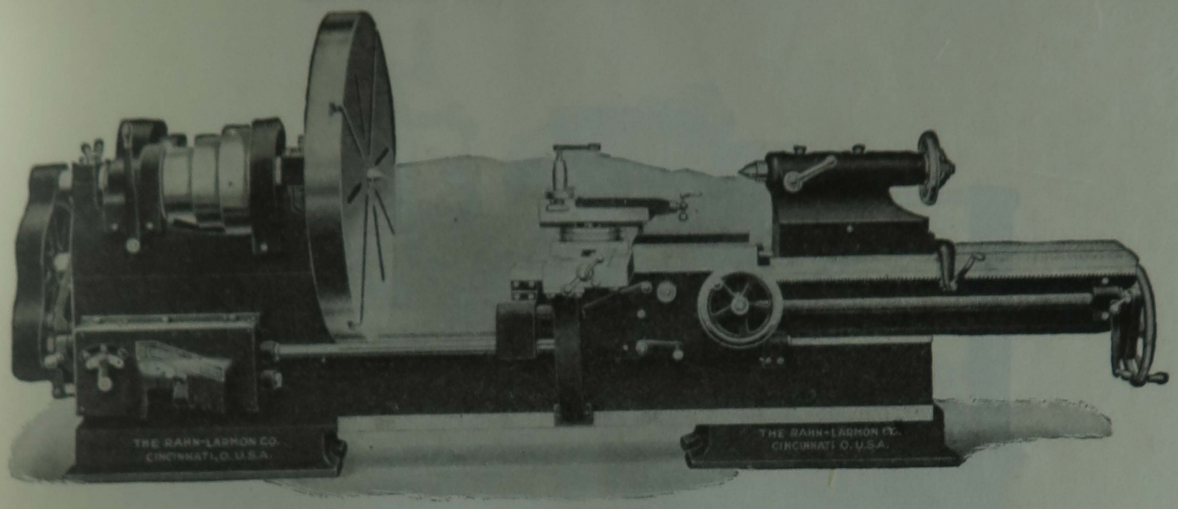


Fig. 945

28-48 INCH SWING

Designed to meet the requirements of repair and jobbing shops, where a large range and variety of work is to be done at a minimum expenditure for equipment. The top bed slides along the lower one and can be adjusted to any width of gap required within range of the lathe. By moving the upper bed, the distance between centers can also be considerably increased. Both beds are very heavy and firmly braced their entire lengths with box girders.

HEAD-STOCK is well ribbed and firmly bolted to the lower bed. The spindle is hollow and ground perfectly cylindrical. The centers are No. 5 Morse taper. The boxes are provided with means for taking up the wear. The driving cone is of extra large diameter, powerfully back-geared and capable of using a broad belt. This lathe is furnished with 3-step cone and double back gear.

TAILSTOCK is of the offset type, which allows the compound rest to be placed parallel to the bed. It is also provided with set-over screws for taper work.

CARRIAGE is gibbed to the bed both front and back and provides a broad bearing for the rest. The front of the carriage is extended and firmly braced, thus allowing extra travel for the compound rest in order that the tool may operate on the largest diameter that can be swung in the gap.

COMPOUND REST is very rigid and has a long, broad bearing on the carriage. It is provided with taper gibs for taking up the wear and the swivel section is graduated.

APRON is of the most simple and effective design, all the feeds being convenient to the hands of the operator. The rack and all the gears are made of steel and the stud pins are hardened and ground. Lead screw nut is provided with safety device preventing screw and gear feed from being engaged simultaneously.

THREAD CUTTING AND CUTTING FEEDS. The quick change screw cutting and feeding mechanism is of very simple and substantial construction. Entire range of thirty changes both for screw cutting and feeding is obtained by shifting of only two levers, and can be made instantly while the lathe is running. The gears throughout are made of bar steel, the shafts are ground and all bearings bronze bushed. The gearing on the end of headstock is so arranged that metric or special threads can be cut by the substitution of different gears. Screw chasing dials are furnished on all lathes of this Series, which obviates the necessity of reversing the spindle when chasing threads.

COUNTERSHAFT has double friction clutch pulleys of very powerful design. Ample oiling facilities are provided and the shaft runs in self-oiling boxes.

REGULAR EQUIPMENT. Parts furnished regularly with each lathe consist of Countershaft, Steady Rest, Follow Rest, Driving Plate, 24-inch Face Plate, 48-inch Face Plate, and Wrenches.

EXTRAS. When desired, these lathes can be furnished at an extra cost with Taper Attachment, long and short Extension Rest, Turret on Carriage, Chucks, Chuck Plates, Turning Tools, or any special Tool Rest. Lathe can also be furnished with Metric Screw and Gear Box or with transposing gears for cutting metric threads.

Specifications

Front bearing	6″ diam. x 8″ long.	Width of top of sliding bed	20½″.
Back bearing	3⅛″ diam. x 5″ long.	Swings over V's	29″.
Hole through spindle	2⅛″.	Swings over gap	50″.
Diameter tail spindle	2⅞″.	Extreme width of gap	3′ (10′ bed).
Traverse tail spindle	10″	Every additional 2′ of bed	1′ additional width of gap.
Cone diameters (3-step)	10″, 13″, 16″.	Swings over carriage	21″.
Width of belt	4″.	Swings over rest	19¾″.
Ratio of double back-gear	12 to 1 and 4.75 to 1.	Length of carriage	31″.
Cuts threads per inch	2 to 20.	Compound rest travel	9″.
Threads on lead screw	4 per inch.	Size of tools	¾″ x 1½″.
Range of feed	.01 to .27″.	Countershaft pulleys	14″ x 5″.
Length of bed, gap closed	10′, 6″ and up, in even lengths.	Speed of countershaft	125 r. p. m.
		Floor space, 10′ lathe	16′ x 2′.
Takes between centers, gap closed	5′.	Every additional 2′ of bed	3′ additional floor space.
Takes between centers, gap open	8′.	Weight of 10′ lathe	8,000 pounds.
Each additional 2′ of bed	3′ additional between centers, gap open.	Weight additional 2′	650 pounds.
		Weight 10′ lathe, boxed	9,200 pounds.
		Weight additional 2′, boxed	900 pounds.
Depth of sliding bed	12″.	Size of box, 10′ lathe	5′, 2″ x 5′, 6″ x 12′ or 341 cubic feet.
Depth of lower bed	12½″.		

Prices on Application

UNIVERSAL TURRET LATHES

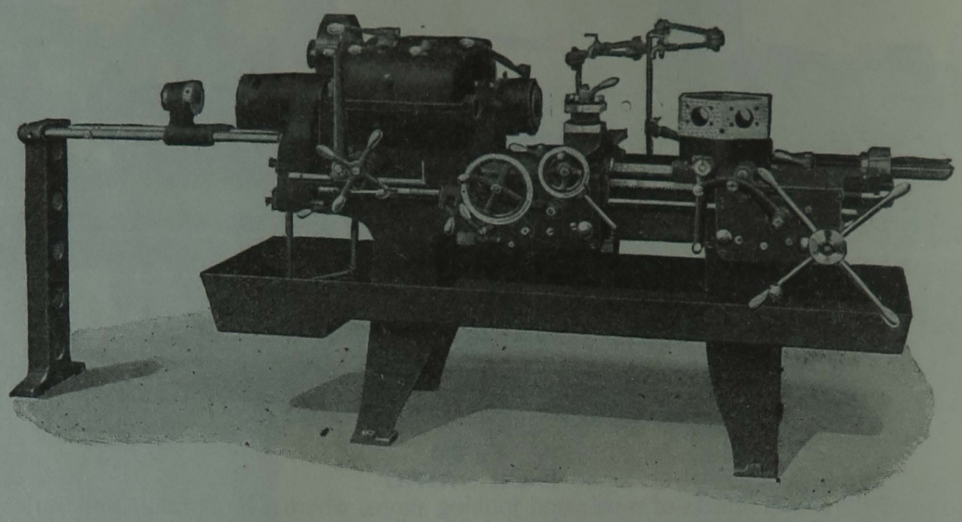


Fig. 946

Represents the latest development in turret lathe construction.

The machine is capable of handling bar and chucking work with equal facility and with a range, from wide forming work in steel to turning hard cast iron of the largest diameter that can be held in the three-jaw chuck. The head has power in excess of the largest requirements of several cutting tools working simultaneously at a coarse feed. As many as twelve cutters can be mounted on the two tool carrying units at one setting. The turret and cross slide can be operated simultaneously and independently with widely different feeds. The twelve speed changes and the twelve feed changes, each having a great range, provide means for the correct and most efficient combinations of cutting speeds and feeds. Both the turret saddle and cross slide carriage are equipped with independently adjustable stops and operate with exceptional ease. All operating levers are designed and located with the idea of securing the maximum ease and convenience of operation on the part of the workman.

The equipment of standard tools and attachments which can be furnished with the machine, is unusually complete and extensive and makes this machine ideal, not only for manufacturing in large quantities, but also for handling a great variety of parts in small quantities. It also includes tools and attachments for work of more or less special nature.

Specifications—NO. 1B

Swing	Over bed ..... 15½″
	Over carriage guides ..... 14″
	Over carriage cross slide ..... 8″
Automatic Chuck Capacity (Push out and drawback)	Round bar ..... 2″
	Square bar ..... 1⅜″
	Hexagon Bar ..... 1⅝″
	Increased collet capacity ..... 4⅝″
Scroll Chuck Head	Size of three-jaw chucks ..... 7½″
	Hole through spindle ..... 2⅜″
	Thread, spindle nose . . 5½ diam., 6 pitch
	Speed of drive pulley ..... 510 R. P. M.
Bearings	Front spindle bearing . . . . 3½ D. 5½ L.
	Back spindle bearing ..... 3¼ D. 4½ L.
Spindle Speeds	20, 27, 36, 48, 64, 86, 111, 149, 200, 267, 355, 480 R. P. M.
	Width of belt ..... 3″
	Diameter of drive pulley ..... 12″
	H. P. required (approximately) 5
Countershaft Plain	Speed for iron and steel . . . . 382 R. P. M.
	Diameter tight and loose pulleys ..... 10″
	Belt on tight and loose pulleys ..... 4″
Bed	Width between centers of ways ..... 9⅞″
	Length of ways ..... 52″
Carriage	Total cross travel ..... 10″
	Total longitudinal travel ..... 24″
Power Cross Feeds	.0019, .0029, .0041, .0063, .0075, .0095, .0116, .0136, .016, .025, .039, .054 inches
Longitudinal Feeds	.0028, .0042, .0061, .0093, .011, .014, .017, .020, .024, .037, .057, .080″.
Size of Cutters	For square turret and cross slide tools ..... ½″x1″
Taper Attachment	Maximum turning length ..... 6″
	Maximum taper to foot ..... 3″
Screw Cutting Attachment	Any pitch from ..... 2 to 32
	Leader cuts in multiples of 1 and 4 of its own pitch
Turret	Diameter of turret across flats ..... 11″
	Size of tool holes in turret face ..... 2½″
	Size of drilled holes in turret faces ..... ½″
	Number of drilled holes in turret face . . . 4
	Distance between centers of drilled holes ..... 3½″x2″
	Center of tool holes to top of turret . 2¼″
	Effective turning movement of turret saddle ..... 22″
	Maximum distance between end of spindle and face of turret ..... 30″
	Power feed to turret . . . . .0028, .0042, .0061, .0093, .011, .014, .017, .020, .024, .037, .057, .080 inches
Threading Capacity	..... 1½″
Floor Space	Without bar feed (approximately) 4′x8′6″
	With bar feed (approximately) . . . . 4′x12′
Weights	Net, with auto chuck and B. F. . 2,750 lbs.
	Net, without auto chuck and B.F. 2,500 lbs.
	Crated for shipment ..... 2,950 lbs.
	Boxed for export ..... 3,550 lbs.
	Dimensions of Box ..... 3′4″x5′0″x7′10″
	Cubic measurements, boxed . . . 127 C. F.

Prices on Application

SHAPERS

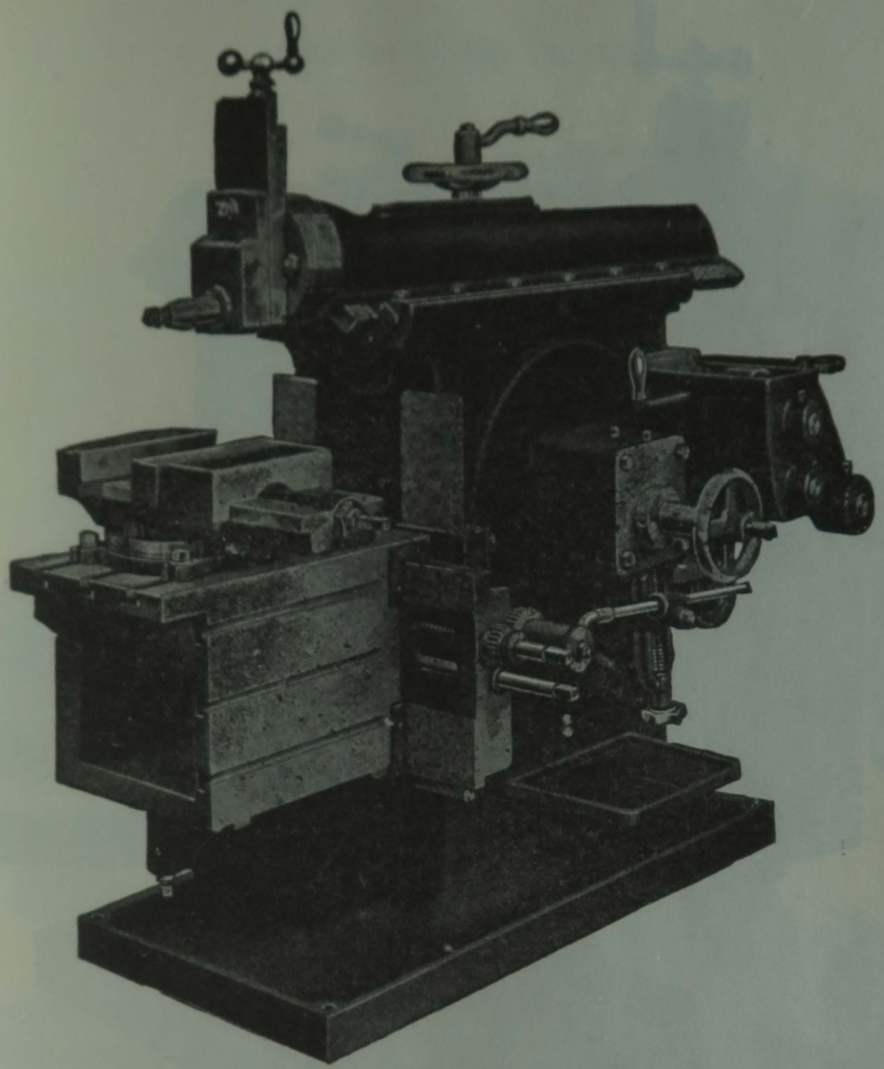


Fig. 947

20 INCH—WITH GEAR BOX

THIS SHAPER is regularly furnished with single pulley drive, gear box, giving, with back gears, ten changes of speed, vee bearings for ram, swivel vise, box-table support and without countershaft, none being necessary, as tight and loose pulleys are provided on the machine. Power down feed to head can be furnished on special order.

MOTOR REQUIREMENTS: 3 to 5 H. P., Constant speed, about 1150 R. P. M.

Specifications

Planes Long	20¾″	Size Tool Ordinarily Used in Post	¾x1½″
Planes Wide	24″	Length of Rocker Arm	35¾″
Maximum Distance—Table to Ram	14¼″	Diameter Driving Pulleys	14x5″
Vise—between Jaws	12″	Width of Driving Belt	4⅞″
Size of Vise Jaws	1⅞x11⅜″	Change of Speed	10
Ram—Width	10¾″	Largest Shaft through Column	3¼″
Total Length	46½″	Revolutions of Driving Shaft	240 R. P. M.
Height from Floor	40½″	Net Weight, Lbs	2,900
Bearing in Column	31″	Boxed for Export, Lbs	3,675
Vertical Feed for Head	7″	Size Case	50x62x69
Size for Box-table	14x18″	Over all Floor Space	47x81½″
Extreme Height	60″	Size of Base	23x48″

Regular equipment includes vise table support and necessary wrenches.

Prices on Application

SHAPERS

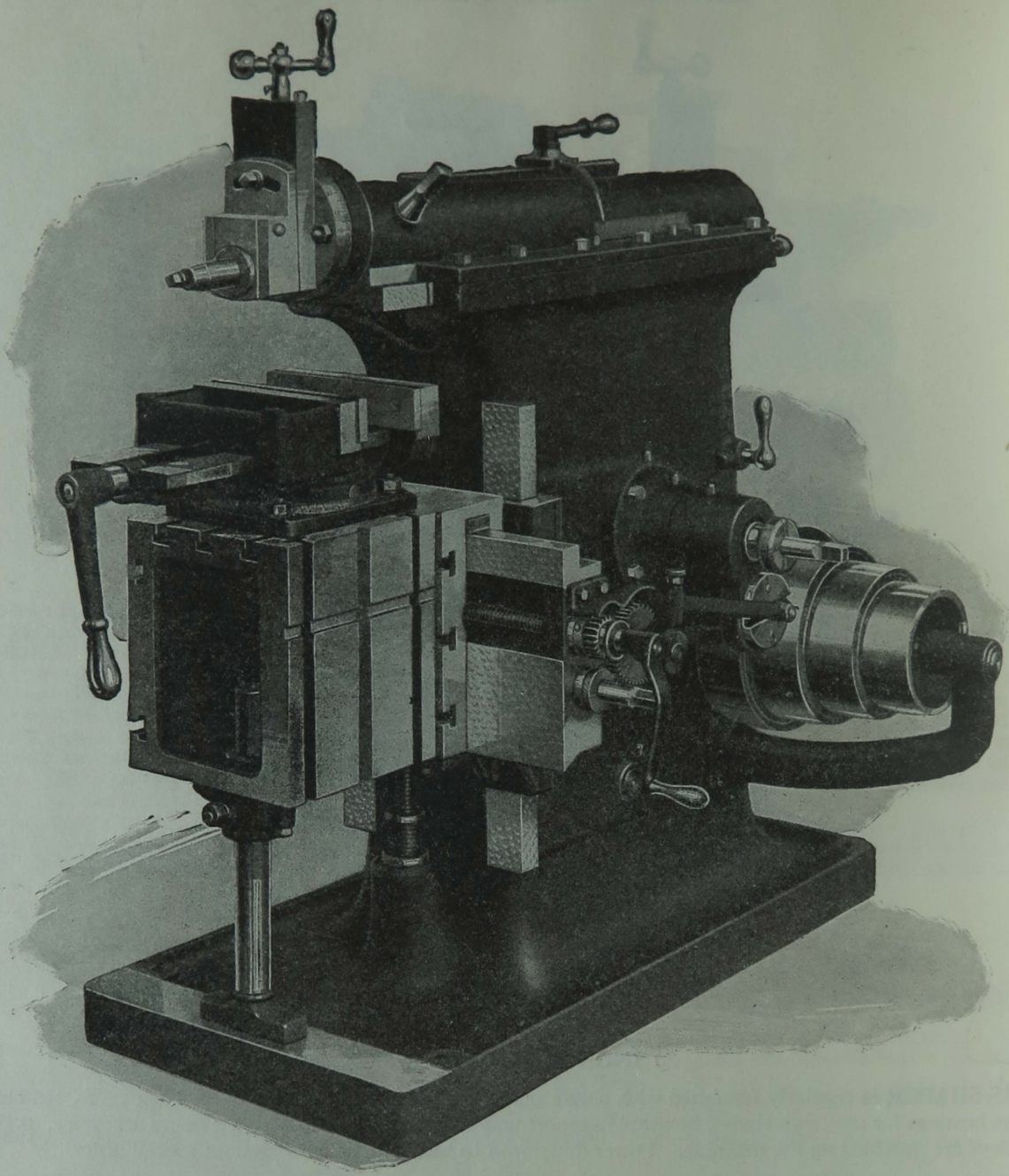


Fig. 948

A heavy powerful tool, designed to withstand the present up-to-date manufacturing requirements. Particular features are the full length taper gibs, the new style rocker arm, the outer support for pulley shaft, the bushing with wool felt oil retainers for all shaft bearings, the heavy arch shaped ram, the roller bearing between ram and rocker arm, the power vertical feed to the table, the convenience of the adjusting levers, which are all on the right side in easy reach of the operator, the accurate graduations on the elevating screw, cross feed, head, down feed, and vise.

Specifications

Actual Length of Stroke	16¾ in.	Feeds from	.012 in. to .112 in.
Horizontal Travel of Table	20 in.	Size of Vise Jaws	2¼x10 in.
Vertical Travel of Table	13¼ in.	Vise Opens	12 in.
Top of Table	11x16 in.	Cone Diameters	7 5/16 to 12 1/16 in.
Number of Speed Changes	8	Width of Belt	3 in.
Range of Strokes per Minute	11 to 82	Tight and Loose Pulleys	12 in. x 3¾ in.
Length of Ram Without Head	38 in.	Speed of Countershaft	260 r.p.m.
Length of Ram Bearing in Column	30 in.	Single Gear Ratio	6 to 1
Width of Ram Bearing in Column	9 in.	Back Gear Ratio	19 to 1
Width of Column for Rail	12½ in.	Size of Base	22 in. x 46 in.
Key-seating Capacity	3 in.	Crated Weight Lbs.	2,250

Prices on Application

HEAVY PATTERN PLANERS

BELT OR MOTOR DRIVEN

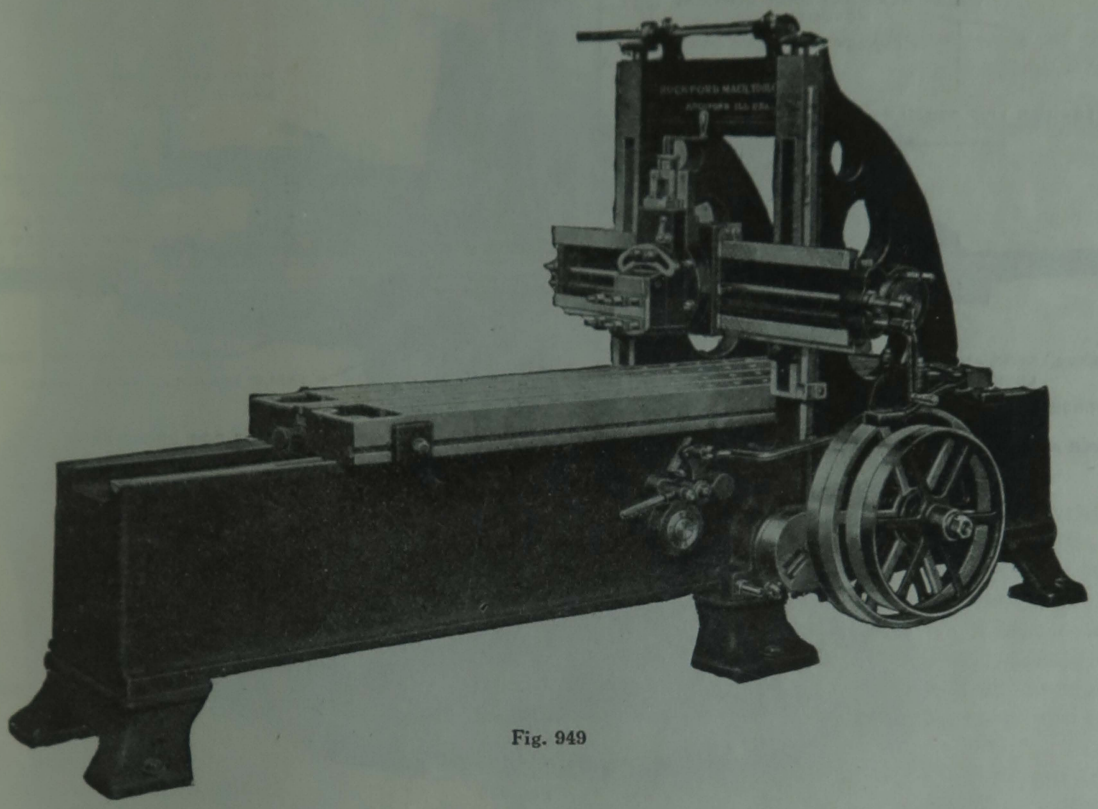


Fig. 949

Designed to withstand the present up-to-date manufacturing requirements.

The beds are 1⅔ longer than the table. The cross girders in the bed are box section, 20 inches center to center. The shaft bearings are bored to jig and bushed. Housings are box section and extend down over the full depth of the bed. Housings for 32 inch and larger are finished to receive side heads which can be furnished at any time and attached by purchaser without trouble. Saddles are of the solid construction, eliminating the usual clamp and are fitted with taper gibs for top and back of rail slide. Saddles are right and left allowing tools to be used close together without reducing the width of the saddle bearing on crossrail. Saddles are graduated around the entire circle allowing heads to be adjusted from either side of the machine. Side heads have horizontal, vertical and angular power feeds. Aluminium drive pulleys on machine avoids shock at reverse and prevents shrieking of belts. Table has dirt-proof feature preventing grit from entering V's. Drive gears are all inside of the bed out of the way of falling chips. Feed friction is the double releasing type, will run at high speed without heating. Safety lock on operating lever prevents planer starting except at will of operator.

Specifications

Planes	24½x24½ in.
Dimensions of Table	72x21x4¼ in.
Travel of Table	6 ft. 8 in.
Length of Bed	10 ft.
Distance between V's	12 in.
Width of V's	2¾ in.
Depth of Rail	10½ in.
Height, Top of Table to Floor	29¾ in.
Length of Down Feed	9½ in.
Width of Machine Belts	1½ in.
Diameter of Pulleys on Planer	20 in. and 24 in.
Tight and Loose Pulleys	16x3¾ in.
Face of Rack	3⅞ in.
Pitch of Rack	4
Ratio of Speed between Belt and Table	35 6:1
Ratio of Return to Cutting Speed	3:1
Speed of Countershaft	340 r. p. m.
Cutting Speed	30 ft.
Total Working Space	15 ft. x 5 ft. 10 in. x 5 ft. 10 in.
Weight, Lbs.	6,500

Prices on Application

UNIVERSAL GRINDING MACHINES

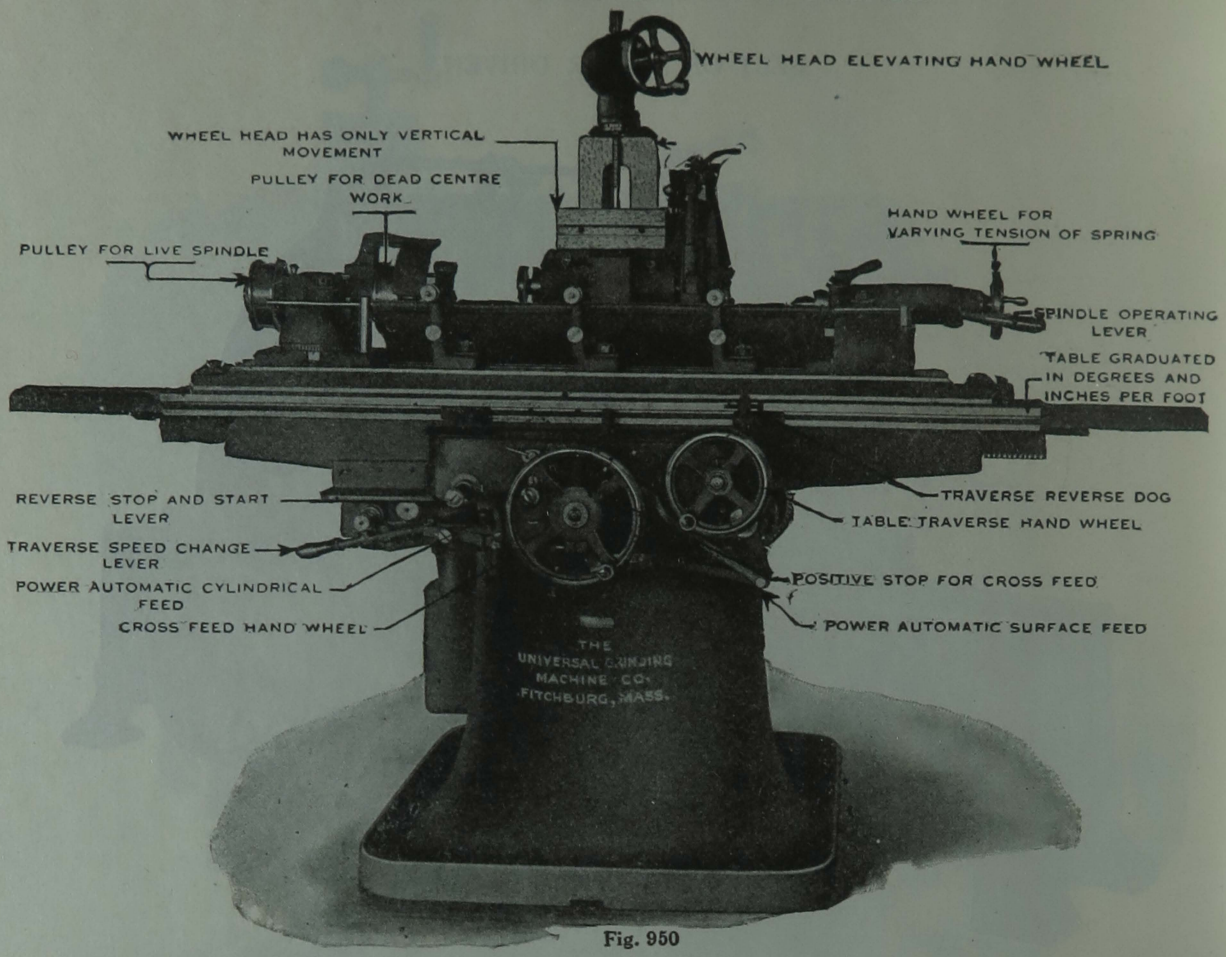


Fig. 950

Designed for the purpose of combining in a single machine efficient means for the grinding of cylindrical, internal Surface, Disc, Cutter and Reamer work of all descriptions.

In this machine are incorporated all the essential features necessary for performing the various grinding operations with as much rapidity and accuracy as could be accomplished on a single purpose machine using the same size wheel; being so designed that the changing of machine from one operation to another is reduced to a minimum.

Specifications

Normal range of EXTERNAL CYLINDRICAL Grinding, swing 10″ diam, 25″ between centers.
Normal range of INTERNAL grinding, swing 10″ diam., 8″ long.
Normal range of SURFACE grinding, 9″ wide, 7½″ high, 20″ long.
Normal range of DISC grinding, 16″ diam., 3½″ thick.
Vertical movement of grinding wheel head, 7½″.
Cross slide movement 9″.
Swivel table graduated to grind up to 2½″ taper per foot, can be moved beyond for grinding greater tapers.
Headstock swivel graduated to 90 degrees.
Cross slide knee graduated to 90 degrees.
Grinding wheel elevating screw provided with micrometer reading handwheel graduated to one-thousandth of an inch.
Headstock and footstock spindle 2″ diam.
Headstock and footstock center No. 3 Morse taper.
Grinding wheel spindle 1⅝″ diam., bearings 4½″ and 4″ long.
Grinding wheel spindle has four speeds: 1,750, 2,100. 2600, 3200 R. P. M.
Grinding wheel pulley 4″ diam., 2¼″ face.
Work has five speeds: 62, 115, 162, 226, 324 R. P. M.
Traverse movement of work for cylindrical grinding has five speeds: 3, 3¾, 5½, 7½ and 11 feet per minute.
Traverse movement of work for surface grinding has five speeds: 1¼, 2½, 3½, 4¾ and 7 feet per minute.
Internal spindle has four speeds: 7,000, 8,400, 10,400, 12,800 R. P. M.
Least amount of reduction by automatic feed at each reversal of work .00025″.
Automatic surface feed 1/64″ to 3/64″.
Countershaft main drive tight and loose pulleys, 10″ diam. 3½″ face, 800 R. P. M.
Three horse-power required.
Net weight of machine, 4140.
Gross weight of machine, crated, 4640.
Gross weight of machine, boxed for export, 5135.
Dimensions boxed, cu. ft.: machine 121.6 countershaft 39.5, attachments 17.8.
Floor space required, 104″ x 104″.

COMPLETE EQUIPMENT "C"

Surface grinding attachment.
2 spring back rests.
8″ chuck attachment.
Cutter bar attachment.
Horizontal vise.
1 center rest.
Low tooth rest stand.
No. 0 Diamond.
Water attachments.
Complete set of wrenches.
High tooth rest stand.
6 assorted grinding wheels.
2 balanced grinding dogs.
Swivel plate clamps.
1 set of six wheels.
1 Diamond Stand for Cylindrical Grinding.
1 Diamond Stand for Surface Grinding.
1 Diamond Stand for Internal Grinding.
No. 2 Internal grinding attachment, with No. 2 Internal spindle.
Universal work holder and flange plate.
1—1⅜″ wheel collet, 5″ long for special grinding.
1—1⅜″ wheel collet, 1½″ long, for surface grinding.
1—½″ wheel collet, 4″ long, for cutter grinding with 4″ cup wheel.
1—5″ wheel collet, for 12″ wheel x 1½″ face, for cylindrical grinding.

Prices on Application

POWER HAMMERS

REGULAR PATTERN

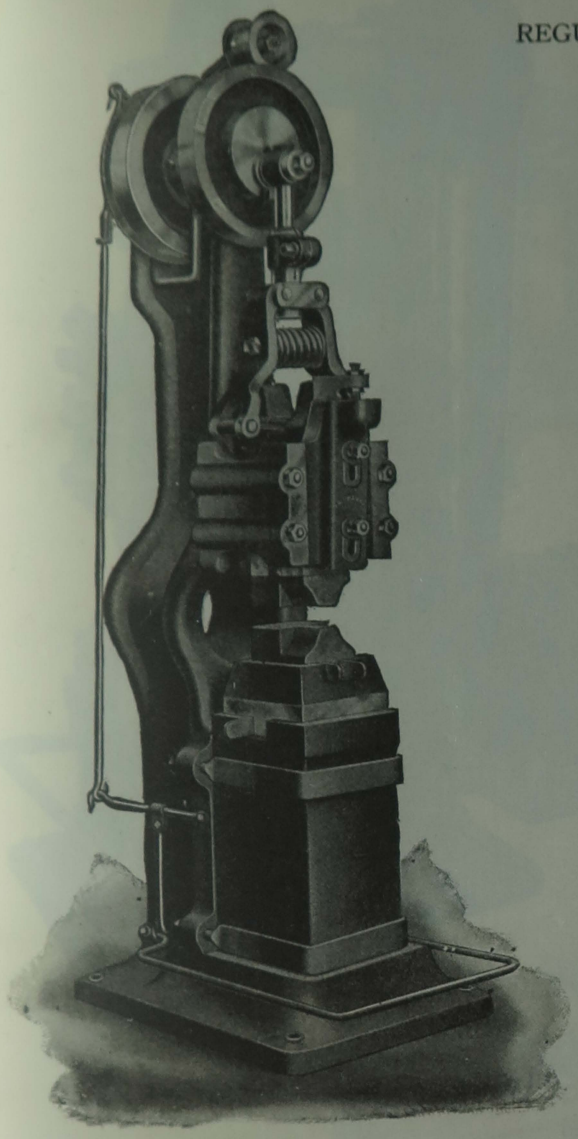


Fig. 951

Hammer can be adapted to different sizes of stock by changing the length of the stroke, an adjustment which can be made very easily and quickly. This is an especially desirable feature in a shop where the total amount of work requires only one hammer. It is also possible to use a large size hammer, not only for heavy work, but also for occasional light jobs. This is accomplished by exerting a light pressure on the treadle. When the pressure is light the belt slips on the pulley, reducing the speed of the plunger so that its full force is not exerted. By varying the pressure on the treadle it is possible to obtain a blow of just the right intensity to suit the work. The **Fairbanks Hammer** can be easily adapted to different kinds of work by using special dies which are interchangeable with the regular dies, so that they do not have to be fitted to the hammer at the factory, but can be applied at any time when the work requires their use.

The hammers are operated by an adjustable crank allowing the operator to lengthen or shorten the stroke at will. Motion is applied to the hammer head by means of a connecting rod, which carries a crosshead connected to the head by means of links. A heavy spiral spring is used to obtain an elastic blow, which removes danger of breakage and also prevents undue shock to the machine. With this arrangement a quick, sharp blow is secured which is most effective and desirable in hammer work.

PRINCIPAL STRUCTURAL FEATURES are simplicity of construction; economy of power and floor space; adaptability to various requirements; easy adjustment; large range of work; durability unequaled; working parts guarded.

Specifications

Sizes	O	A	B	C	D	E	F	G	H	I
Wgt. of ram, lbs.	25	50	75	100	125	150	200	300	400	500
Size of base, ins.	18¾x28¾	20¾x29¾	21½x31¾	22½x34	24x35¾	26½x38½	29x42¼	32¾x47	35¾x49¾	39x53
Dia. of driving pulley, ins.	10	12	13	14½	15½	16	16¾	17⅝	19¼	21
Size of belt, ins.	2	2½	2½	3	3½	4	4½	5	6	7
Aver. no. of blows per minute	400	375	350	325	300	275	250	225	200	175
Length of stroke, ins.	7	7	7¾	8¼	9¼	10	10½	11	11	11½
Adapted to work stock, ins.	1	1½	2	2½	3	3½	3¾	4¼	5	6
Hgt. foundation to center of shaft, ins.	63½	65½	68½	71¼	74½	76⅜	79¼	84	88⅝	90½
Total hgt. over all, ins.	77½	82½	86¾	91¼	94¼	100¼	101½	110½	115⅛	119
Size dies, ins.	3½x5	4⅝x5¾	4⅝x6¾	5x7	5x7¼	6x8	6x8¼	6½x8½	7⅛x9⅛	8x10
Approx. wgt., lbs.	1600	2050	2500	3000	3400	4000	4950	6000	7800	9500
Approx. wgt. boxed for export, lbs.	1800	2300	2750	3250	3650	4300	5200	6400	8400	10000
Approx. meas. of box, cubic feet	38	42	48	59	63	79	110	144	165	180

Prices on Application

MOTOR DRIVEN HAMMERS

FAIRBANKS

The Fairbanks Hammer adapts itself readily to an electrical motor drive.

The advantages of a motor-driven hammer which appeal more generally to the purchaser are that the hammer may be located in the most convenient place for use irrespective of main line shaft, and also when not in use no power is consumed.

The Hammer is operated by an adjustable crank allowing the operator to lengthen or shorten the stroke at will. Motion is applied to the Hammer Head by means of a connecting rod, which carries a crosshead connected to the head by means of links. A heavy spiral spring is used to obtain an elastic blow, which removes danger of breakage and also prevents undue shock to the machine. With this arrangement a quick, sharp blow is secured which is most effective and desirable in Hammer work.

SIMPLICITY OF CONSTRUCTION

The main frame is a massive one-piece casting arranged with a circular opening in the back opposite to the face of the dies, which enables long stock to be run through when so desired. As few parts as possible have been used without sacrificing anything essential to the proper working of the Hammer. The shaft journals are cast integral with the frame, so that there are no cap bolts to work loose with the consequent possibility of the shaft getting out of alignment.

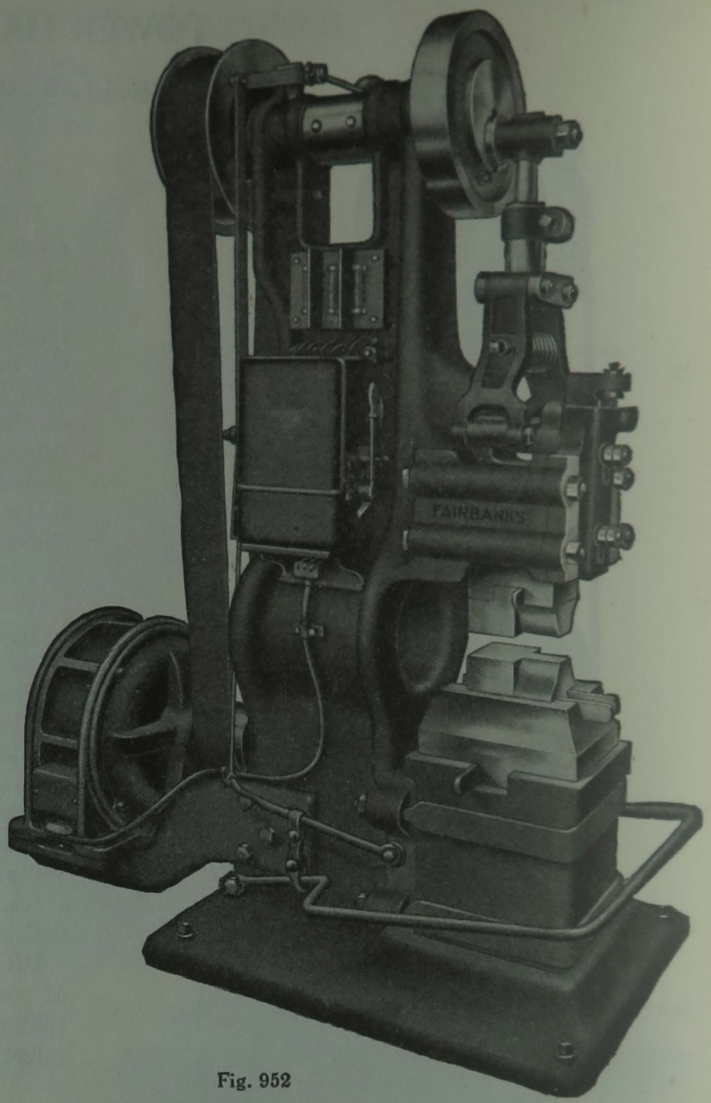


Fig. 952

SIZES AND DETAILS OF MOTOR-DRIVEN HAMMERS

Specifications

Size	O	A	B	C	D	E	F	G	H	I
Wgt. of Ram, Lbs.	25	50	75	100	125	150	200	300	400	500
Size of Base, Ins..	18¾x28¾	20¾x29¾	21½x31¾	22½x34	24x35¾	26½x38½	29x42¼	32¾x47	35¾x49¾	39x53
Floor Space Required, Ins.....	18¾x48¾	20¾x55½	21½x57	22½x58¾	24x58½	26½x63⅞	29x70¼	32¾x74⅜	35¾x80½	39x83
Dia. of Pulley, Ins.	10	12	13	14½	15½	16	16¾	17⅝	19¼	21
Size of Belt, Ins..	2	2½	2½	3	3½	4	4½	5	6	7
Number Blows per Minute.....	400	375	350	325	300	275	250	225	200	175
Lgth. Stroke, Ins.	7	7	7¾	8¼	9¼	10	10½	11	11	11½
Adapted to Work Stock, Ins.....	1	1½	2	2½	3	3½	3¾	4¼	5	6
Total Height Over All, Ins.....	69¼	72¼	75¾	79¼	83	85⅛	88½	93¾	99¼	101½
H. P. of Motor...	2	3	3	5	5	5	7½	7½	10	10
R.P.M. of Motor, Full Load.....	900	900	900	850	850	850	800	800	800	800
Size of Dies, Ins..	3½x5	4⅝x5¾	4⅝x6¾	5x7	5x7¼	6x8	6x8¼	6½x8½	7⅛x9⅛	8x10
Approx. Wgt. of Hammer, Lbs..	1850	2300	2775	3100	3700	4400	5400	6400	8300	9800
Approx. Wgt. Boxed for Export, Lbs....	2050	2600	3000	3400	4000	4800	5800	7000	8800	10,400
Approx. Measurement of Box, Cub. Ft.....	42	50	54	68	72	87	126	164	208	228

Prices of Hammers fitted with motor drive quoted on application.

DRILL PRESSES

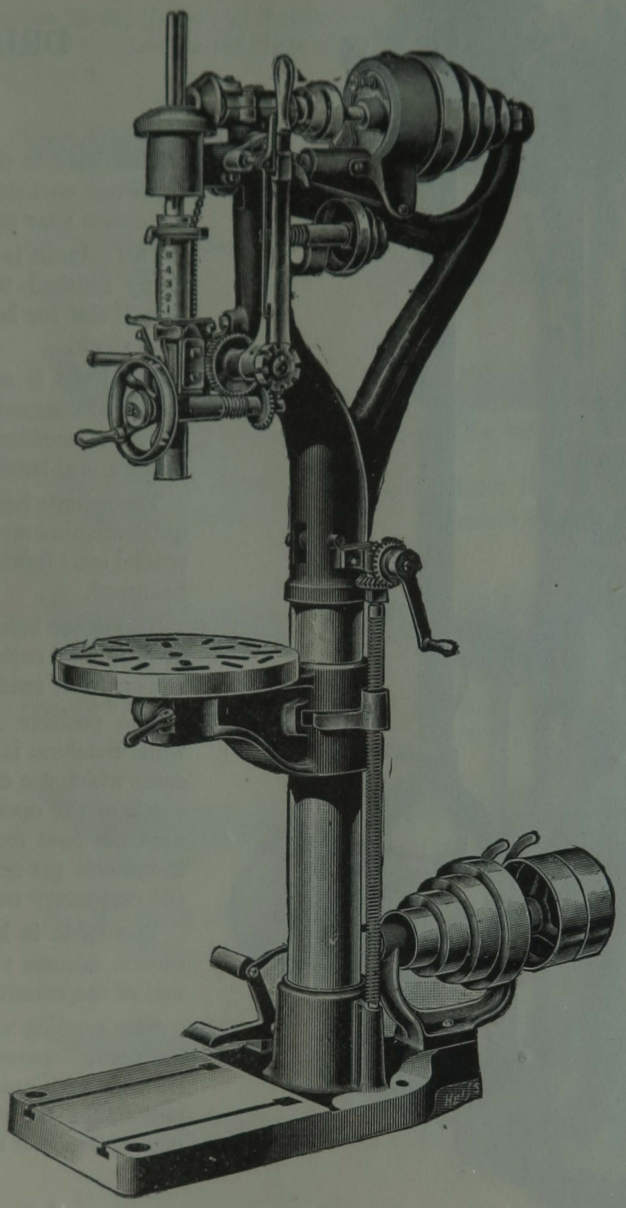


Fig. 953

20-INCH BACK GEARED is a most thoroughly modern and up-to-date power drill, combining all the good features that a machine of its kind ought to have; in every respect equal and in many respects superior to any drill of its size previously placed on the market. It combines simplicity and speed in operation with strength and rigidity and drills with perfect accuracy from the smallest hole up to 1½ inch. The gears are machine cut. The bearings are all large and powerful. The change from a plain drill to a back geared drill is done in an instant by a movement of an eccentric shaft. The drill is made with either round or square base; has eight speeds with three distinct and complete feeds—power feed, hand wheel feed, and lever feed. It is supplied with all the graduated and automatic features of higher priced drills. The spindle is counterbalanced by a weight in the hollow column; has automatic stop with quick return lever, giving rapid movement to the spindle. Has quick action screw for raising and lowering the table.

Specifications

Height of Drill	75 in.	Traverse of Spindle	8 in
Distance between Table and Spindle	27 in.	Size of Tight and Loose Pulleys	8x2¾ in.
Distance between Spindle and Base	42¼ in.	Size of Cone Pulleys (4 step)	4, 5¾, 7½, 9x2 in. face
Distance from Column to center of Spindle	10¼ in.	Speed of Driving Pulleys	300 R. P. M.
Diameter of Column	5¼ in.	Floor Space Required	22x35 in.
Traverse of Table on Column	18½ in.	Horse Power Required	1
Diameter of Table	16 in.	Weight—Net	675
Diameter of Spindle	1¼ in.	Crated Weight	800

Hole in Spindle bored to fit Morse Taper No. 4

Prices on Application

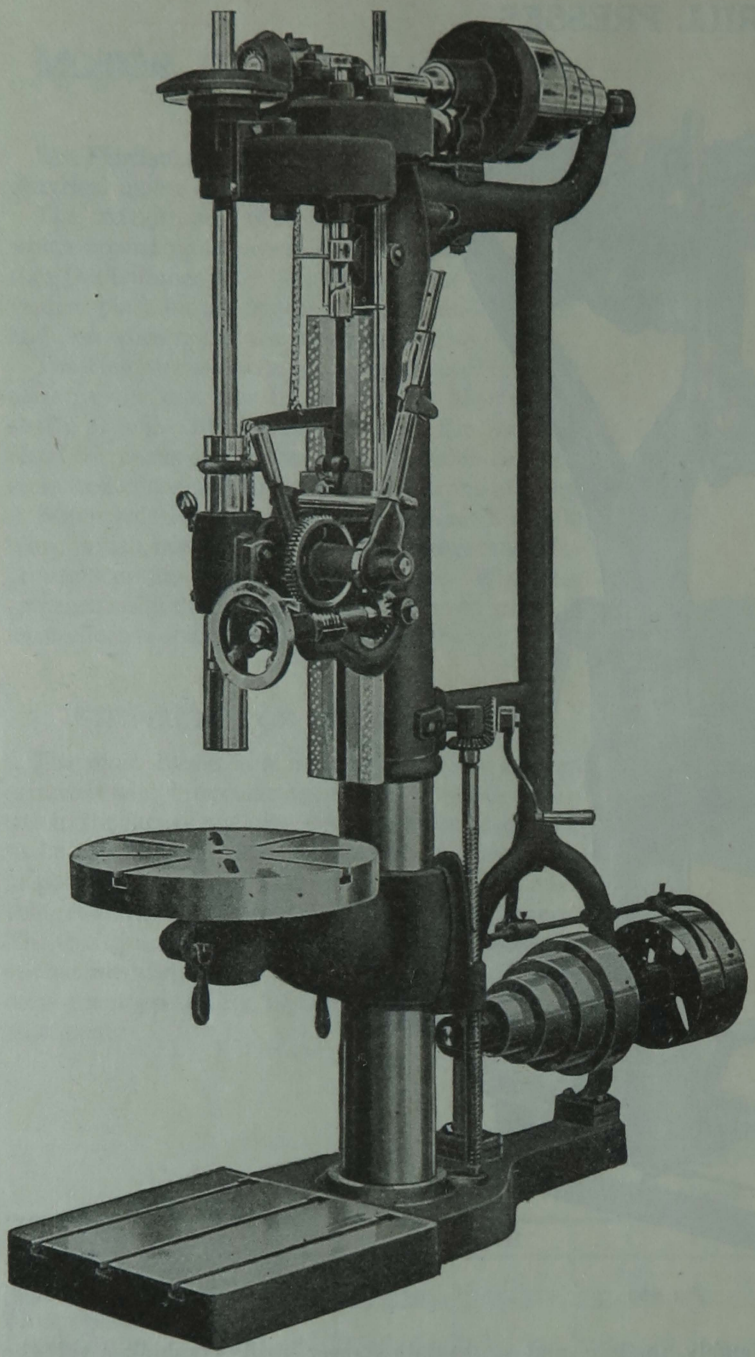


Fig. 954

DRILL PRESSES

The drive is through four step cone pulleys, improved enclosed back gear, and a correctly cut crown gear and pinion.

The column is of generous proportions accurately finished to receive the arm and head. The T slot for head clamping bolts is cut from solid stock.

The head is adjustable on the column; has means of compensating for wear on the spindle sleeve; is counterbalanced by weight inside the column, and readily clamped in desired position.

The spindle has eight speeds; is provided with quick advance and return; is made of high carbon special steel finished by grinding, and is counterbalanced.

The sleeve is finished by grinding and is operated by steel rack and pinion; it has depth gauge cut on front reading in inches.

The positive feeds are instantly available while machine is running by the feed changing cams which are conveniently placed within easy reach of the operator and indicate in plain figures the feed for each position of the cam in thousands per revolution of spindle, eliminating the customary confusing speed plate.

The table is heavily ribbed, revolves on its center, adjusts vertically, and swings to either side of the column.

The tapping attachment is very strong and compact, operating through positive steel clutches with quick return. The crown gear and pinion, also the return gears are steel. The vertical return gear is bushed with hard bronze.

Drills to Center of Circle	24″
Maximum Distance Spindle to Table	32″
Maximum Distance Spindle to Base	45½″
Column Diameter	6⅝″
Spindle with Morse Taper Number	4
Spindle Vertical Travel	11″
Spindle Diameter in Sleeve	1⅝″
Spindle Diameter above Sleeve	1½″
Diameter of Crown Gear	8 7/16″
Diameter of Crown Pinion	3 9/16″
Pitch of Crown Gear and Pinion	6
Sleeve, Diameter	2⅞″
Sleeve, Length	13¼″
Spindle Rev. with Back Gears Engaged,	10, 20, 34 and 65 r.p.m.
Spindle Rev. without Back Gears Engaged,	45, 84, 144 and 274 r.p.m.
Size of Tight and Loose Pulleys	10x3⅛″
Speed of Tight and Loose Pulleys	280
Diameter of Steps on Cone Pulleys	10⅛, 8⅛, 6⅛ and 4⅛″
Face of Steps on Cone Pulleys	2⅞″

Feed per Revolution of Spindle	003, 007, 011, 023, 060, 095
Diameter of Round Tables	20¼″
Size of Square Tables	18½x18½″
Table Vertical Adjustment	17″
Horse Power of Constant Speed Motor Required	1½ h.p.
Maximum Permissible Speed of Motor	1200
Floor Space, Belt Drive	63x20″
Floor Space, Motor Drive through Gearing	61x32″
Total height with Tapping Attachment	112¼″
Total height Without Tapping Attachment	107¼″
No. 1 Compound Table Size	12x12″
No. 1 Compound Table Adjustment	6½x8½″
No. 2 Compound Table Size	20x18″
No. 2 Compound Table Adjustment	13x18″
Net Weight	1450 Lbs.
Weight Crated for Domestic Shipment	1600 Lbs.
Weight Boxed for Export Shipment	1900 Lbs.
Size of Box for Export Shipment	85x36x30″
Cubic feet in Box for Export Shipment	53

LATHE TOOLS

Hammer forged at the proper heats, shaped to a standard size by gauges and template and properly tempered; ground and finished ready for use. These tools when made of high speed steel will stand the severest kind of work. For ordinary purposes, carbon steel is used.

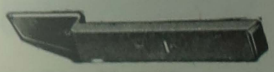


Fig. 955

No. 1—Left Hand Side Tool

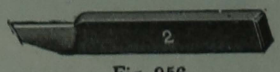


Fig. 956

No. 2—Right Hand Side Tool

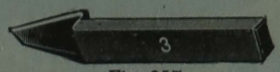


Fig. 957

No. 3—Left Hand Bent Side Tool

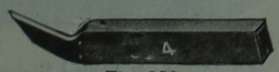


Fig. 958

No. 4—Right Hand Bent Side Tool

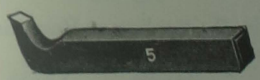


Fig. 959

No. 5—Left Hand Diamond Point

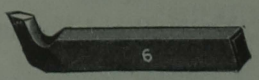


Fig. 960

No. 6—Right Hand Diamond Point

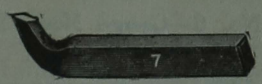


Fig. 961

No. 7—Right Hand Bent Diamond Point

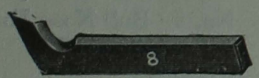


Fig. 962

No. 8—Right Hand Bent Diamond Point

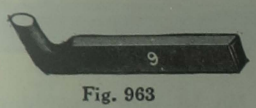


Fig. 963

No. 9—Round Nose

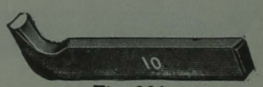


Fig. 964

No. 10—Water Finishing Tool

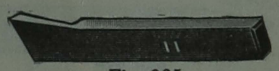


Fig. 965

No. 11—Straight Cutting Off Tool

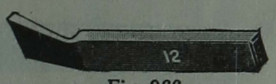


Fig. 966

No. 12—Bent Cutting Off Tool

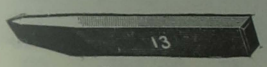


Fig. 967

No. 13—Straight Thread Tool

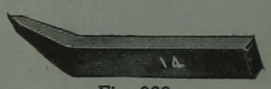


Fig. 968

No. 14—Bent Thread Tool

Fig. 969

No. 15—Inside Turning Tool

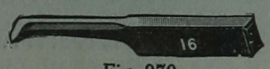


Fig. 970

No. 16—Inside Thread Tool

Fig. 971

No. 17—Bull Nose Tool

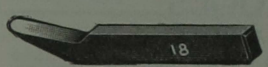


Fig. 972

No. 18—Finishing or Necking Tool

Fig. 973

No. 19—Scaling or Roughing Tool

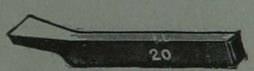


Fig. 974

No. 20—For Trueing Up Centers

Set of 10 includes Nos. 1, 2, 5, 6, 9, 11, 13, 15, 16 and 19.
Set of 12 includes Nos. 1, 2, 4, 5, 6, 9, 11, 13, 14, 15, 16 and 19.
Set of 16 includes Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 16 and 19.
Set of 20 includes all tools illustrated above.

Regularly supplied in sets as specified but varying combinations will be furnished if desired.

CARBON STEEL

Size of Tool, Inches	¼x½	5/16x5/8	⅜x⅝	⅜x¾	½x1	⅝x1¼	⅝x1½	¾x1½	¾x1¾	1x2
Length, Inches	4	4½	5	5½	7½	9	10	11½	12	14
Each	$0.34	.34	.50	.50	1.00	1.50	2.00	2.20	2.70	4.20
Weight per Set of 10, Lbs.	1¼	3½	5	5½	11	19	9½	35	42	75
Per Set of 10	$3.40	3.40	5.00	5.00	10.00	15.00	20.00	22.00	27.00	42.00
Weight per Set of 12, Lbs.	1½	4¼	6	6⅞	13¼	23	33	42	50	90
Per Set of 12	$4.08	4.08	6.00	6.00	12.00	18.00	24.00	26.00	32.40	50.40
Weight per Set of 16, Lbs.	2	6	8	9¼	18½	29	44	56	68	120
Per Set of 16	$5.44	5.44	8.00	8.00	16.00	24.00	32.00	35.20	43.20	67.20
Weight per Set of 20, Lbs.	2½	7	10	11	22	38	55	70	84	150
Per Set of 20	$6.80	6.80	10.00	10.00	20.00	30.00	40.00	44.00	54.00	84.00

Each Set in a Box

For High Speed Steel, Prices on Application. Special Sizes and Shapes made to order,

PLANER AND SHAPER TOOLS

Hammer forged at the proper heats, shaped to a standard size by gauges and templets and properly tempered. Hardened and ground ready for use. There are two grades, carbon steel for all ordinary purposes and high speed steel for the severest kind of work.

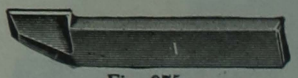


Fig. 975

No. 1—Left Hand Side Tool

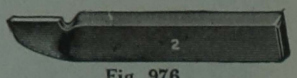


Fig. 976

No. 2—Right Hand Side Tool

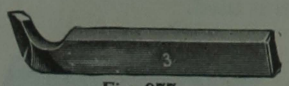


Fig. 977

No. 3—Left Hand Bent Side Tool

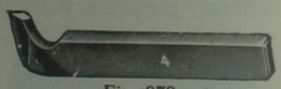


Fig. 978

No. 4—Right Hand Bent Side Tool

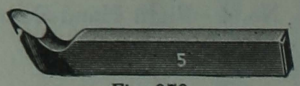


Fig. 979

No. 5—Bull Nose For Heavy Cuts

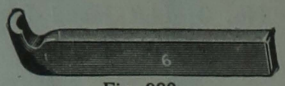


Fig. 980

No. 6—Gouge Nose Tool

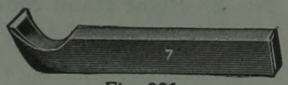


Fig. 981

No. 7—Broad Nose or Stocking Tool

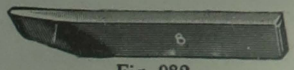


Fig. 982

No. 8—Scaling or Roughing Tool

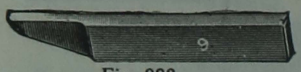


Fig. 983

No. 9—Right Hand Siding Tool

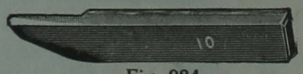


Fig. 984

No. 10—Left Hand Siding Tool

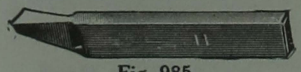


Fig. 985

No. 11—For Finishing in Corners

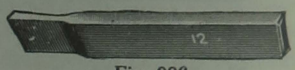


Fig. 986

No. 12—Cutting Off Tool

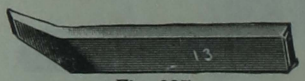


Fig. 987

No. 13—Right Hand Bevel Tool

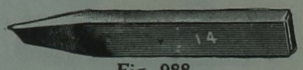


Fig. 988

No. 14—Left Hand Bevel Tool

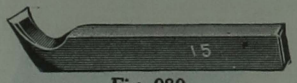


Fig. 989

No. 15—Smoothing Tool for Cast Iron

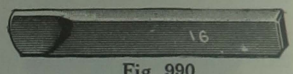


Fig. 990

No. 16—For Smoothing Wrought Iron

Set of 12 includes Nos. 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 13, 14.

Size of Tool, Inches	**⅜x¾**	**½x1**	**⅝x1¼**	**⅝x1½**	**¾x1½**	**¾x1¾**	**1x2**
Length, Inches	5½	8	10	11	12	13	15
Each	**$0.50**	**1.00**	**1.50**	**2.25**	**2.50**	**3.00**	**4.50**
Weight per Set of 12, Lbs.	7	13½	26½	38	45	53	99
Per Set of 12	**$6.00**	**12.00**	**18.00**	**27.00**	**30.00**	**36.00**	**54.00**
Weight per Set of 16, Lbs.	9	18	35	50	60	70	132
Per Set of 16	**$8.00**	**16.00**	**24.00**	**36.00**	**40.00**	**48.00**	**72.00**

Each Set in a Box

LATHE TOOLS

RED—E

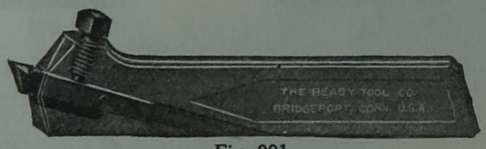


Fig. 991

STYLE X

Holder drop forged from chrome nickel steel; Special hardening treatment makes the outside hard with the inside tough and strong so that the holder will not mash down; inserted half-round section of tool steel, electrically welded in place protects the cutter slot from wear; High Speed Steel Cutters.

*STRAIGHT OR OFFSET

Right or Left Hand

NOS.	**1**	**2**	**3**
Size Cutter, Inches.	5/16x2½	⅜x3	7/16x3½
Size Holder, Inches.	½x1x6¼	⅝x1¼x7½	¾x1½x9½
Weight Each, Lbs..	.....	.....	.....
Each	**$2.40**	**2.95**	**3.85**

*For straight pattern numbers are X1, X2 and X3; For offset pattern, light hand, numbers are XR1, XR2 and XR3; for offset pattern, left hand numbers are XL1, XL2 and XL3. Also made in sizes Nos. 4 and 5.

EXTRA CUTTERS

High Speed Steel

For Sizes, Nos	**1**	**2**	**3**
Each	**$0.28**	**.52**	**.80**
Per Dozen	**$3.30**	**6.20**	**9.60**

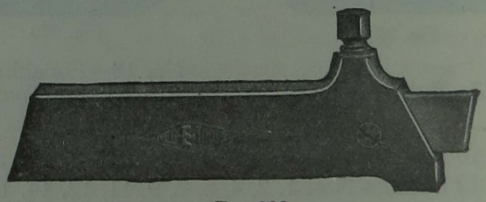


Fig. 992

CUTTING OFF

Furnished ready for use, no grinding or heat-treating necessary; Cutters have full clearance on both sides and one grind sharpens cutters and maintains clearance. There are no projections on the sides of the holder and cutter can get up close to the tool post, insuring rigid support.

STRAIGHT PATTERN

NOS.	**E1**	**E2**
Size of Cutter, Inches	¾x1⅛x4	⅞x 3/16x5
Size of Holder, Inches	½x 1x6	⅝x1¼x7
Weight Each, Lbs.	.....	.....
Each	**$2.10**	**2.65**

OFFSET PATTERN

Right or Left Hand

NOS.	**F1**	**F2**
Size of Cutter, Inches	¾x1⅛x4	⅞x 3/16x5
Size of Holder, Inches	½x 1x6	⅝x1¼x7
Each	**$2.10**	**2.65**

TOOL HOLDERS

Holders made from drop-forged steel, perfectly machined and designed. Made in three different patterns, straight, right and left hand off-set. Cutters from high speed steel perfectly tempered and ground.

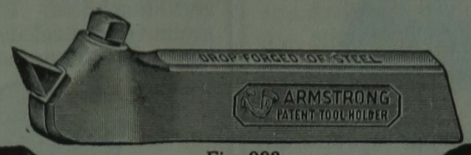


Fig. 993

NO. 00S—Straight

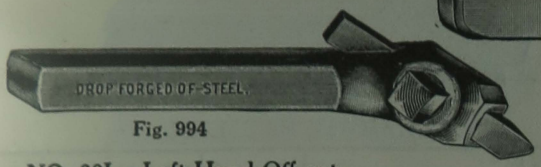


Fig. 994

NO. 00L—Left Hand Off-set

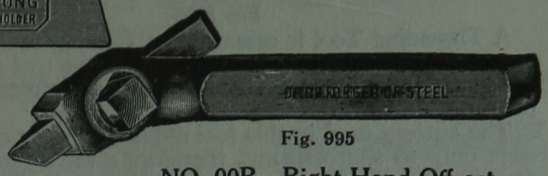


Fig. 995

NO. 00R—Right Hand Off-set

STRAIGHT SHANK

Left Hand, Number	Straight Shank, Number	Right Hand, Number	Size of Holder, Inches	Size of Cutter, Square, Inches	Weight Each, Lbs.	Extra Cutters, Each	Complete, Each
00L	00S	00R	5/16 x 3/4 x 4 1/2	3/16	1/2	$0.25	$1.80
0L	0S	0R	3/8 x 7/8 x 5	1/4	3/4	.30	1.90
1L	1S	1R	1/2 x 1 1/8 x 6	5/16	1 1/2	.45	2.15
2L	2S	2R	5/8 x 1 3/8 x 7	3/8	2 1/4	.65	2.70
3L	3S	3R	3/4 x 1 5/8 x 8	7/16	3 1/2	1.00	3.60
4L	4S	4R	7/8 x 1 3/4 x 9	1/2	4 3/4	1.45	4.60
5L	5S	5R	1 x 2 x 11	5/8	7 1/2	2.50	6.50
6L	6S	6R	1 1/4 x 2 1/4 x 13	3/4	12	4.10	9.00
7L	7S	7R	1 1/2 x 2 1/2 x 16	7/8	19	6.00	15.00
750L	750S	750R	1 5/8 x 2 3/4 x 18	1	26	8.60	22.00
800L	800S	800R	1 3/4 x 3 x 20	1 1/8	32	11.90	28.50

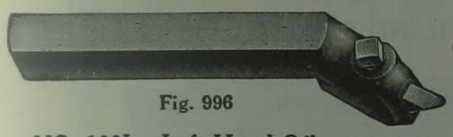


Fig. 996

NO. 100L—Left Hand Off-set

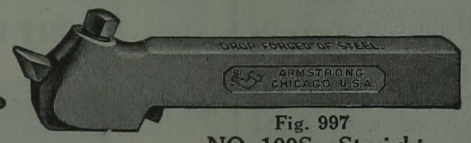


Fig. 997

NO. 100S—Straight

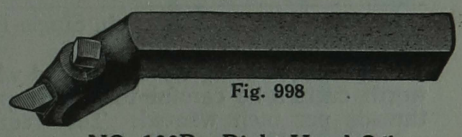


Fig. 998

NO. 100R—Right Hand Off-set

DROP HEAD

Designed especially for use on Lathes of British and European make having clamp tool rest, and American lathes of similar design with high slide rest or low centers. The head and screw are extra heavy and the goose-neck shape of holder makes it an excellent shaper and planer tool.

Left Hand, Number	Straight Shank, Number	Right Hand, Number	Size of Holder, Inches	Size of Cutter, Square Inch	Height from Bottom of Shank to Cutter Point, Inches	Weight Each, Lbs.	Extra Cutters, Each	Complete, Each
100L	100S	100R	1/2 x 5/8 x 6	3/16	9/16	3/4	$0.25	$1.90
101L	101S	101R	5/8 x 3/4 x 7 1/2	1/4	11/16	1 1/4	.30	2.25
201L	201S	201R	3/4 x 7/8 x 8 1/2	5/16	13/16	2	.45	2.85
102L	102S	102R	7/8 x 1 x 9 1/2	3/8	15/16	3	.65	3.65
301L	301S	301R	1 x 1 1/8 x 10 1/2	7/16	1 1/16	4 1/4	1.00	4.60
103L	103S	103R	1 1/8 x 1 1/4 x 11 1/2	1/2	1 3/16	6	1.45	5.80
104L	104S	104R	1 3/8 x 1 1/2 x 13 1/2	5/8	1 5/16	10	2.50	8.60
105L	105S	105R	1 5/8 x 1 3/4 x 15 1/2	3/4	1 1/2	16	4.10	13.80
106L	106S	106R	1 7/8 x 2 x 17 1/2	7/8	1 3/4	23	6.00	20.50
107L	107S	107R	2 1/8 x 2 1/4 x 19 1/2	1	2	31	8.60	27.50

CUTTERS FOR TOOL HOLDERS

Fig. 999
1—Left Hand Turning Tool

Fig. 1000
2—Round Nose Turning Tool

Fig. 1001
3—Right Hand Turning Tool

Fig. 1002
4—Left Hand Corner Tool

Fig. 1003
5—Threading Tool

Fig. 1004
6—Right Hand Corner Tool

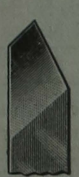


Fig. 1005
7—Left Hand Side Tool

Fig. 1006
8—Square Nose Tool

Fig. 1007
9—Right Hand Side Tool

Shapes Nos. 1, 2, 3 and 8 are standard and can be furnished at regular prices for extra cutters. No. 8 is furnished as regular equipment with tool holders.

Special cutter forms as well as modifications of those shown if needed will be suggested by the character of the work to be done and the nature of the metal to be machined.

Prices on Application

THREADING TOOLS

ARMSTRONG

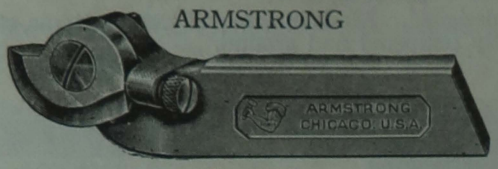


Fig. 1008

A Threading Tool is essentially a forming tool and any error or inaccuracy of shape or angle in the tool point will surely be reproduced in the thread and must result in poorly fitted work.

The cutters used in this tool require grinding on the top edge only to sharpen, and therefore always remain true to form and of correct angle; its use thus insures perfect fitting threads, and saves much grinding, as well as dispensing entirely with forging and tempering. The cutters are backed off to afford proper clearance. The back of cutter is excentric in form and bears upon a hardened stop screw. This arrangement allows of positive and accurate adjustment.

Nos.	Size of Holder, Inches	Weight Each, Lbs.	Each	
			With Carbon Steel Cutter	With High Speed Cutter
00T	5/16 x 3/4 x 5	3/4	$2.25	$2.75
50	3/8 x 7/8 x 5	7/8	2.25	2.75
51	1/2 x 1 1/8 x 6	1 1/2	2.75	3.35
52	5/8 x 1 3/8 x 7	2 1/4	3.50	4.25
53	3/4 x 1 5/8 x 8	3 1/2	4.50	5.50
54	7/8 x 1 3/4 x 9	4 1/4	5.50	6.50
55	1 x2 x10	6 1/4	7.00	8.25

One in a Box with Wrench, Single Point Cutter, V, U. S. or Whitworth Standard.

Note—In ordering tools equipped with U. S. or Whitworth cutters be careful to specify pitch or number of threads per inch wanted. Tools equipped with single point Sharp V cutter will always be shipped unless otherwise ordered.

Tools with carbon steel cutters will be sent if high speed is not specified.

CUTTERS FOR THREADING TOOLS

List of Cutters Furnished Include:

Single point and chasing cutters in both carbon and treated high speed steel, to cut the pitches listed beneath in Sharp V, Whitworth and U. S. Standard, except as noted.

Single Point Cutters

NOS. 00T and 50—All standard pitches, 6 to 20, inclusive.
NO. 51—All standard pitches, 5 to 20, inclusive.
NO. 52—All standard pitches, 4 to 20, inclusive.
NOS. 53, 54 and 55—All standard pitches, 3 to 20, inclusive

Chaser Cutters

NOS. 00T and 50—14, 16, 18, 20, 24*
NO. 51—11 1/2*, 12, 13†, 14, 16, 18, 20, 24*
NO. 52—8, 9, 10, 11, 11 1/2*, 12, 13†, 14, 16, 18, 20
NOS. 53 and 54—8, 9, 10, 11, 11 1/2*, 12, 13†, 14, 16, 18, 20

*V Thread only. †Not made in Whitworth.

PRICE LIST OF CUTTERS

Sharp V, Whitworth or U. S. Standard Shape
For Tool Nos.

00T and 50		51		52		53 and 54		55
Sgle. Point	Chaser	Sgle. Point	Chaser	Sgle. Point	Chaser	Sgle. Point	Chaser	Sgle. Point Only
				Carbon	Steel			
$0.75	$1.25	$0.90	$1.40	$1.15	$1.65	$1.40	$1.90	$1.95
				High Speed	Steel			
1.50	2.50	1.80	2.80	2.30	3.30	2.80	3.60	3.90

Note—When ordering cutters or chasers (except single point V cutters) it is necessary to specify exact pitch or number of threads per inch.

When High Speed is not specified in order, carbon steel cutters will be shipped.

CUTTING-OFF TOOLS

ARMSTRONG

Holders made of drop forged steel, perfectly designed and machined. Cutters high speed steel, accurately ground and beveled on both sides, are held on an angle and have proper clearance, thereby insuring a clean-cutting tool.

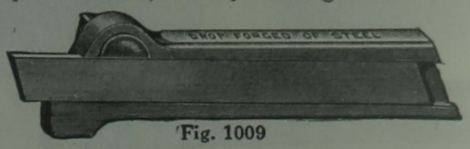


Fig. 1009

STRAIGHT PATTERN

Straight Shank Nos.	Size of Holder, Inches	Size of Cutter, Inches	Weight Each, Lbs.	Complete, Each
19	5/16 x 3/4 x 4 1/2	5/64 x 1/2	1/2	$1.90
20	3/8 x 7/8 x 5	3/32 x 5/8	3/4	2.00
21	1/2 x 1 1/8 x 6	1/8 x 3/4	1 1/4	2.40
22	5/8 x 1 3/8 x 7	1/8 x 7/8	2 1/4	3.00
23	3/4 x 1 5/8 x 8	3/16 x 1	3 1/4	4.00
24	7/8 x 1 3/4 x 9	3/16 x 1 1/8	4 1/2	5.00
25	1 x2 x10	1/4 x 1 1/4	6 1/2	6.50
26	1 1/4 x 2 1/4 x 11	1/4 x 1 3/8	6	7.75

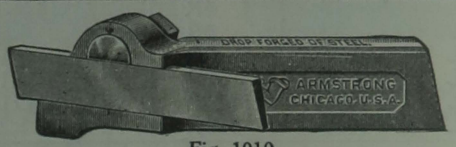


Fig. 1010

RIGHT HAND OFFSET PATTERN

Fig. 1011

LEFT HAND OFFSET PATTERN

Left Hand Offset Nos.	Right Hand Offset Nos.	Size of Shank, Inches	Size of Cutter, Inches	Weight Each, Lbs.	Complete, Each
29L	29R	5/16 x 3/4	5/64 x 1/2	5/8	$1.90
30L	30R	3/8 x 7/8	3/32 x 5/8	3/4	2.00
31L	31R	1/2 x 1 1/8	1/8 x 3/4	1 1/2	2.40
32L	32R	5/8 x 1 3/8	1/8 x 7/8	2 1/4	3.00
33L	33R	3/4 x 1 5/8	3/16 x 1	3 1/2	4.00
34L	34R	7/8 x 1 3/4	3/16 x 1 1/8	4 3/4	5.00
35L	35R	1 x2	1/4 x 1 1/4	6 3/4	6.50
36L	36R	1 1/4 x 2 1/4	1/4 x 1 3/8	9	7.75

Each Tool boxed separately includes Wrench and one High Speed Cutter.

EXTRA CUTTERS

The nature of the work renders occasional breaking off on cutting tools unavoidable and in the case of forged tools this involves reforging and grinding, the lathe meanwhile standing idle. With the Armstrong cutting-off tool the delay is momentary, as the blade can be extended and point sharpened in a few moments.

For Cutting-Off Tools Nos.			Dimensions, Inches	High Speed Steel Cutters, Each
19	19L	19R	5/64 x 1/2	$0.60
20	20L	20R	3/32 x 5/8	.65
21	21L	21R	1/8 x 3/4	.90
22	22L	22R	1/8 x 7/8	1.30
23	23L	23R	3/16 x 1	2.15
24	24L	24R	3/16 x 1 1/8	2.90
25	25L	25R	1/4 x 1 1/4	4.00
26	26L	26R	1/4 x 1 3/8	4.65

SIDE TOOLS

ARMSTRONG

Holders made of drop forged steel, perfectly machined and designed. Cutters high speed steel, accurately ground and beveled on both sides, are held on an angle. Having proper clearance, a clean-cutting tool is assured.

OFF-SET PATTERN

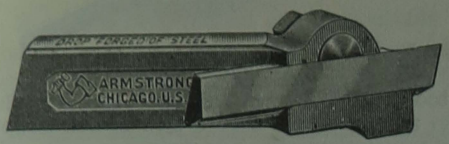


Fig. 1012

Left Hand

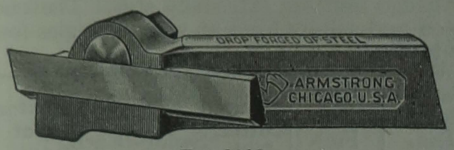


Fig. 1013

Right Hand

Left-Hand NOS.	Right-Hand NOS.	Size of Shank, Inches	Weight Each, Lbs.	Extra Cutters, Each	Complete, Each
69L	69R	5/16 x 3/4	5/8	$0.60	$1.90
70L	70R	3/8 x 7/8	3/4	.90	2.25
71L	71R	1/2 x 1 1/8	1 1/2	1.40	2.90
72L	72R	5/8 x 1 3/8	2 1/4	2.30	4.00
73L	73R	3/4 x 1 5/8	3 1/2	3.40	5.25
74L	74R	7/8 x 1 3/4	6	5.00	7.10
75L	75R	1 x 2	8 1/2	6.00	8.50
76L	76R	1 1/4 x 2 1/4	12 3/4	7.90	11.00

STRAIGHT SHANK

Straight shank side tools are well adapted to use on the planer and shaper for many classes of work on which they will be found exceptionally convenient and efficient.

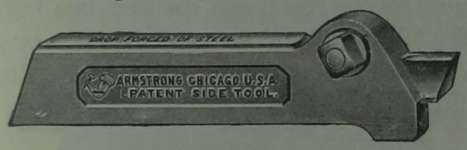


Fig. 1014

Right Hand

Left Hand

Fig. 1015

Left-Hand NOS.	Right-Hand NOS.	Size of Holder, Inches	Weight Each, Lbs.	Extra Cutters, Each	Complete, Each
79L	79R	5/16 x 3/4 x 4 1/2	5/8	$0.60	$1.90
80L	80R	3/8 x 7/8 x 5	3/4	.90	2.25
81L	81R	1/2 x 1 1/8 x 6	1 1/4	1.40	2.90
82L	82R	5/8 x 1 3/8 x 7	1 3/4	2.30	4.00
83L	83R	3/4 x 1 5/8 x 8	3 1/4	3.40	5.25
84L	84R	1 x 1 3/4 x 9	5	5.00	7.10
85L	85R	1 1/8 x 2 x 11	7 1/2	6.00	8.50
86L	86R	1 1/4 x 2 1/4 x 13	11	7.90	11.00
87L	87R	1 1/2 x 2 3/8 x 15	16	10.00	15.75

PLANER TOOLS

ARMSTRONG

Holders made of drop forged steel perfectly machined and designed. Cutters high speed steel, accurately ground. Fig. 1016 illustrates tool cutting keyway; Fig. 1017 illustrates tool cutting in close corners. A general idea of clearance and the angles to which cutters can be set is shown by the illustrations.

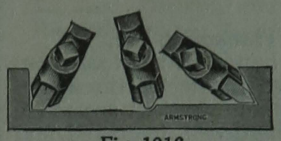


Fig. 1016

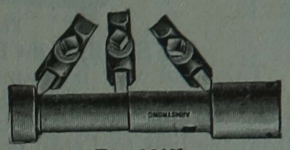


Fig 1017

Fig. 1018

NOS.	Dimensions Holder, Ins.	Dimensions Cutters, Ins.	Weight Complete, Lbs.	Extra Cutters, Each	With High Speed Cutters, Each
40	1/2 x 1 x 7	1/4 x 3/8	1 3/4	$0.45	$3.10
401	5/8 x 1 1/4 x 8 1/2	5/16 x 7/16	3 1/4	.65	4.00
41	3/4 x 1 1/2 x 10	3/8 x 1/2	5 1/2	.95	5.25
42	1 1/8 x 1 3/4 x 13	1/2 x 3/4	12	2.15	8.25
43	1 3/8 x 2 x 16	5/8 x 7/8	20	3.60	12.75
44	1 7/8 x 2 1/4 x 19	3/4 x 1	35	5.30	19.50
45	2 1/8 x 2 3/4 x 22	7/8 x 1 1/8	52	8.50	30.00

One in a Box with Wrench and Two Cutters

GANG PLANER TOOLS

FOR PLANING LARGE SURFACES

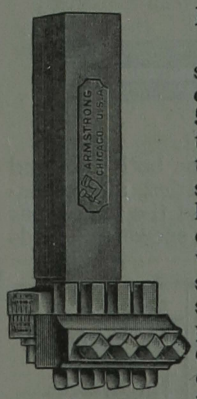


Fig. 1019

This tool is especially adapted for surfacing large castings, and on this class of work it will effect a saving of 50 to 75 per cent in the time required to do the same job with a single point tool. The head is solidly secured to the shank, upon which it swivels to a limited degree, by means of a deep and closely fitted tongue and socket, and when set its position is fixed by two steel collar screws, while two stop screws render slipping of head impossible. The head is graduated, thus enabling the tool to be quickly and accurately set to any desired feed. This makes it possible to always have the tool cutting at the greatest speed practicable on metals of varying degrees of hardness.

As each chip is comparatively light, a planer will, with this tool, carry with ease a feed and depth of cut much greater than is possible when using an ordinary tool, and there is much less tendency to "break out" at the end of cut.

NOS.	Size Shank, Ins.	Length OverAll, Ins.	Size Cutter, Ins.	Wgt. Each, Lbs.	Extra Cutters, Each	Complete, Each
61	1 1/4 x 1 3/4 x 7 1/2	10	3/8 x 1/2	10	$0.85	$13.00
62	1 5/8 x 2 1/4 x 9	12	1/2 x 11/16	20	1.70	22.00
63	2 x 2 1/2 x 11	14	5/8 x 7/8	35	2.80	38.50

One in a Box Complete with One Set (Four) High Speed Cutters, Wrench and Grinding Gauge

BORING TOOL HOLDERS

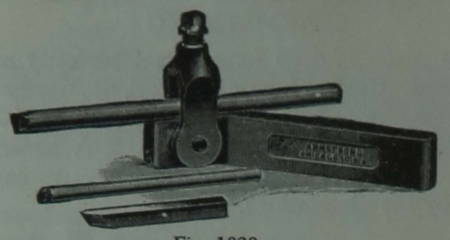


Fig. 1020

For Small, Light Boring, Threading, Etc.

This tool will be found very handy in the tool room for boring work of small internal diameter, threading, brass turning, etc. The boring bars furnished are made from the best tool steel properly hardened, tempered and ground ready for use. The holder is reversible, and can be used for turning either right or left hand.

NOS.	Size of Shank, Ins.	Size of Bars Furnished, Dia. Inches	Size of Sq. Cutter, Inch	Weight Each, Lbs.	Extra Square Cutters, Each	Complete, Each
15	3/8 x 3/4	1/8 and 1/4	1/4	1	$0.30	$2.75
16	1/2 x 1	3/16 and 5/16	5/16	1 3/4	.45	3.50
17	5/8 x 1 1/4	1/4 and 3/8	3/8	2 3/4	.65	4.50
18	3/4 x 1 1/2	5/16 and 7/16	7/16	4 1/2	1.00	5.75

Extra Boring Bars

Diameter, Inches	1/8	3/16	1/4	5/16	3/8	7/16
Length, Inches	4	4 1/2	5	6	7	8
Price, Each	$0.20	.25	.30	.40	.55	.75

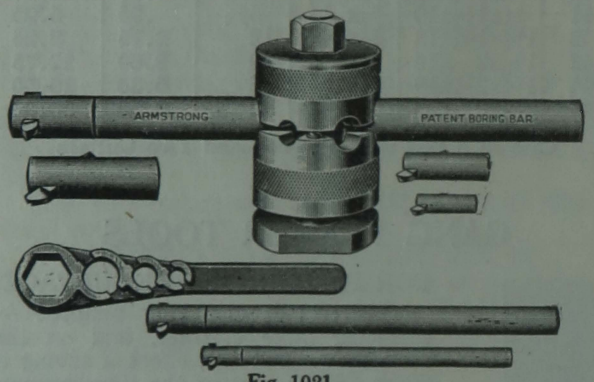


Fig. 1021

THREE BAR

A slight turn of nut releases or fastens both Bar and Holder. Bars can be changed as needed almost instantly, thus allowing the operator to use the stiffest bar possible for each job, with the result that speeds and feeds can be increased and time saved.

NOS.	1-B	2-B
Diameter Bars, Inches	1/2, 3/4 & 1 1/8	9/16, 15/16 & 1 5/16
Length of Bars, Inches	8, 11 & 16	9, 13 & 18
Size of Cutters, In. Sq.	3/16, 1/4 & 3/8	3/16, 5/16 & 7/16
For Lathes, Swinging, Ins.	14 to 16	16 to 18
Weight, Lbs., Per Set	18	27
Per Set	$15.00	$20.25

NOS.	3-B	4-B
Diameter Bars, Inches	3/4, 1 1/8 & 1 1/2	15/16, 1 5/16 & 1 13/16
Length of Bars, Inches	11, 16 & 21	13, 18 & 24
Size of Cutters, In. Sq.	1/4, 3/8 & 1/2	5/16, 7/16 & 5/8
For Lathes, Swinging, Ins.	20 to 22	24 to 32
Weight, Lbs., Per Set	50	75
Per Set	$35.00	$50.00

EXTRA CUTTERS—Ground for Boring

Size, Inch Square	3/16	1/4	5/16	3/8	7/16	1/2	5/8
Price, Each	$0.25	.30	.45	.65	.90	1.20	2.00

Each Set includes holder, three boring bars with straight and 45 degree end caps, six high speed cutters and combination wrench.

BORING TOOLS

ADJUSTABLE

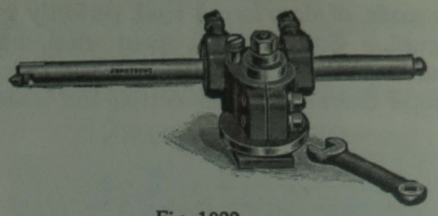


Fig. 1022

This tool combines convenience, adjustability and rigidity to a remarkable degree and is well adapted to a very wide range of work. The holder is easily adjustable to different heights and will hold bars of various diameters. The bars are made from high carbon steel seamless tubing of heavy gauge and are extremely stiff. The cutter can be adjusted and solidly fixed at various angles for boring, facing or turning.

NOS.	Cap. of Holder Dia. Bars, Inches	Size Bar Furnished, Ins.	Size Cutter, Inch Sq.	For Lathes Swinging, Ins.	Wgt. Each, Lbs.	Extra Cutters, Each	Each
212	1/4–1 5/16	1 5/16 x 21	3/8	14–18	25	$0.65	$18.00
213	3/8–1 1/2	1 1/2 x 24	7/16	16–20	38	.90	25.00
214	1/2–1 13/16	1 13/16 x 28	1/2	18–24	75	1.20	40.00
215	5/8–2 1/4	2 1/4 x 36	5/8	20–36	120	2.00	60.00

Note—Bolt head is made large enough to allow for fitting to T slots of various sizes.

Fitting—An extra charge of $1.00 net will be made for fitting bolt head to special dimensions.

Size of Bar	Cutter, Inch Sq.	Weight Each, Lbs.	Extra Cutters, Each	Each
3/4 In. Dia., 14 In. Long	3/16	1 3/4	$0.25	$3.25
15/16 In. Dia., 16 In. Long	1/4	3 1/4	.30	4.00
1 1/8 In. Dia., 18 In. Long	5/16	5	.45	5.50
1 5/16 In. Dia., 21 In. Long	3/8	7 1/2	.65	7.50
1 1/2 In. Dia., 24 In. Long	7/16	11	.90	10.00
1 13/16 In. Dia., 28 In. Long	1/2	19	1.20	15.00
2 1/4 In. Dia., 36 In. Long	5/8	38	2.00	28.00

Each includes one Bar of size specified, two high speed cutters and wrench.

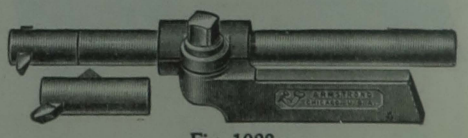


Fig. 1023

Made from the best refined steel, perfectly designed and machined. Cutters high speed steel. Mechanically perfect. Bar can be extended from shank of holder to any desired length, giving greatest degree of stiffness possible on any job. Cutters are pieces of stock size steel and can be readily fitted and ground.

NOS.	Diam. Shank, Inches	Diam. Bar, Inches	Cutter Stock Square, Inches	Extra Cutters, Each	Weight Complete, Lbs.	Each
OOB	5/16 x 3/4	1/2 x 8	3/16	$0.25	1 1/2	$3.25
8	3/8 x 7/8	9/16 x 9	3/16	.25	1 3/4	3.25
9	1/2 x 1 1/8	3/4 x 11	1/4	.30	3 3/4	3.85
10	5/8 x 1 3/8	15/16 x 13	5/16	.45	7	5.10
11	3/4 x 1 5/8	1 1/8 x 16	3/8	.65	11	7.25
12	7/8 x 1 3/4	1 5/16 x 18	7/16	.90	17	10.75
13	1 x 2	1 1/2 x 21	1/2	1.20	25	15.00

Each complete with bar, holder, straight and 45 degree end caps, two cutters and double head wrench.

BORING TOOLS

Fig. 1024

ARMSTRONG

Made from the best refined steel, especially designed for use on lathes, clamp tool rests. Cutters high speed steel of stock size. New cutters can be readily fitted and ground.

NOS.	Size of Shank, Inches	Dia. Bar, Ins.	Lgth. Bar, Ins.	Size of Cutter, Inch Square	Wgt. Each, Lbs.	Extra Cutters, Each	Each
108	3/4 x 7/8	9/16	9	3/16	1½	$0.25	$2.75
109	1 x1 1/8	3/4	11	1/4	3	.30	3.25
110	1¼x1 3/8	15/16	13	5/16	5½	.45	4.35
111	1½x1 5/8	1⅛	16	3/8	9	.65	6.25
112	1¾x1 7/8	1 5/16	18	7/16	15	.90	9.00
113	2 x2 1/8	1½	21	1/2	20	1.20	12.00
114	2¼x2 3/8	1 13/16	24	5/8	31	2.00	18.00
115	2¾x2 7/8	2¼	30	3/4	57	3.60	30.00

BORING TOOLS, LESS SHANK

NOS.	Dim. of Bar		Size of Cutter, Inch Square	With Bushing to Fit Shank Nos.	Wgt. Each, Lbs.	Extra Cutters, Each	Each
	Dia., Ins.	Lgth., Ins.					
0B	1/2	8	3/16	8, 9 or 10	3/4	$0.25	$2.00
08	9/16	9	3/16	9, 10 or 11	1	.25	2.00
09	3/4	11	1/4	10, 11 or 12	2¼	.30	2.50
010	15/16	13	5/16	11, 12 or 13	4½	.45	3.60
011	1⅛	16	3/8	12 or 13	7	.65	5.00
012	1 5/16	18	7/16	13	11	.90	7.00
013	1½	21	1/2	Without Bushing	15	1.20	9.00
014	1 13/16	24	5/8		23	2.00	13.00
015	2¼	30	3/4		44	3.60	23.00

One in a box complete, with bar, holder, straight and 45° end caps, two cutters and wrench.

Note.—In ordering be careful to give size of shank (or number of tool) in which bar is to be used. When this information is not given no bushing will be included.

CUTTER HOLDERS

For Grinding

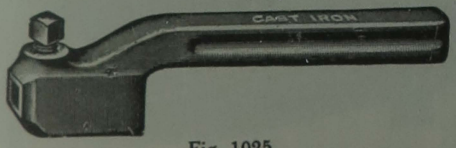


Fig. 1025

Tool Holders are frequently ruined by workmen holding cutters in them while grinding or sharpening, and this wasteful practice can be corrected by the use of these grinding holders.

NOS.	Holds Cutters, Ins.	Weight Each, Lbs.	Each
1G	3/16 and 1/4	1	$0.30
2G	5/16 and 3/8	1½	.35
3G	7/16 and 1/2	2¼	.45
4G	5/8 and 3/4	3½	.60
5G	7/8, 1 and 1⅛	5½	.85

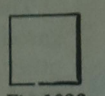
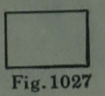
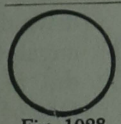
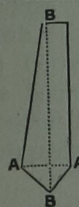
One in a Box

TOOL HOLDER STEEL

SELF-HARDENING—ARMSTRONG SPECIAL

In 3-Foot Bars

Ready to use—No treatment required

	Size, Inches	Per 3-Ft. Bar	Size, Inches	Per 3-Ft. Bar
 Fig. 1026 **SQUARES** For use in Turning and Boring Tools	3/16	$1.20	5/8	$11.10
	1/4	2.00	3/4	15.80
	5/16	3.00	7/8	21.30
	3/8	4.25	1	28.20
	7/16	5.60	1⅛	34.35
	1/2	7.10		
 Fig. 1027 **FLATS** For use in Planer and Slotter Tools	1/4x3/8	3.10	1/2x3/4	11.00
	5/16x7/16	4.25	9/16x3/4	12.00
	3/8x1/2	5.85	5/8x7/8	15.60
	7/16x9/16	8.15	3/4x1	20.65
	1/2x1 1/16	10.35	7/8x1⅛	27.30
 Fig. 1028 **ROUNDS** For use in Turning Tools	1/4	1.65	7/16	4.45
	5/16	2.40	1/2	5.65
	3/8	3.35	5/8	8.80
Fig. 1029 **BEVEL** For use in Cutting-off Tools	5/64x 1/2	2.40	3/16x1	6.00
	3/32x 5/8	2.40	3/16x1⅛	6.60
	1/8x 3/4	3.55	1/4x1¼	9.25
	1/8x 7/8	3.75	1/4x1⅜	9.60
 Fig. 1030 **SPECIAL SHAPE** For use in Side Tools	1/8x 1/2	2.50	5/16x1	7.60
	5/32x 5/8	3.30	3/8x1¼	10.60
	3/16x 3/4	4.15	7/16x1⅜	12.75
	1/4x 7/8	5.85	1/2x1½	18.65

Note.—Rolled to approximate size, but require grinding on edges to bring to exact size fitting cutting-off and side tool holders.

HIGH SPEED STEEL—ARMSTRONG

Cutter Lengths—Hardened

Require grinding only to make them ready for use

Round for Turning Tools

Size, Inches	Length, Inches	Each	Size, Inches	Length, Inches	Each
1/4	2⅜	$0.15	7/16	3⅞	$ .75
5/16	3	.30	1/2	4½	1.00
3/8	3½	.50	5/8	5½	1.95

Bevel for Cutting-Off Tools

Size, Inches	Length, Inches	Each	Size, Inches	Length, Inches	Each
5/64x 1/2	4½	$0.40	3/16x1	8	$1.75
3/32x 5/8	5	.40	3/16x1⅛	9	2.20
1/8x 3/4	6	.65	1/4x1¼	10	3.40
1/8x 7/8	7	.95	1/4x1⅜	11	4.00

Special Shape for Side Tools

Size, Inches	Length, Inches	Each	Size, Inches	Length, Inches	Each
1/8x 1/2	4½	$0.45	3/8x1¼	9	$3.40
5/32x 5/8	5	.50	7/16x1⅜	10	4.60
3/16x 3/4	6	.85	1/2x1½	11	7.35
1/4x 7/8	7	1.45	9/16x1 5/8	15	11.00
5/16x1	8	2.20			

SQUARE HOLE DRILLING HEADS

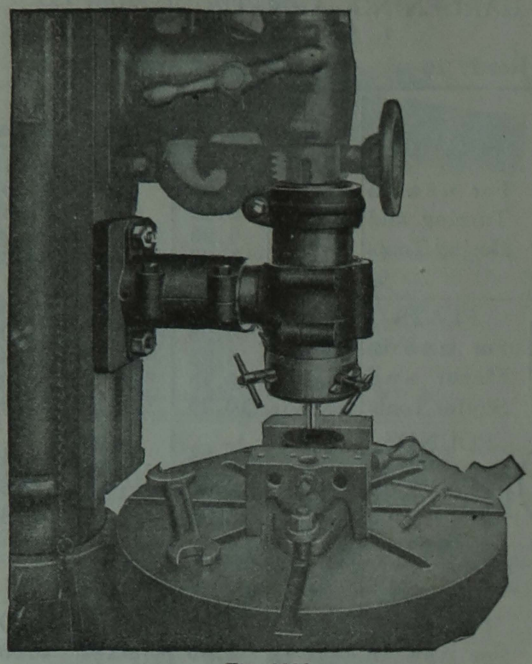


Fig. 1031
Drill Press Type

RADBORE

For use on milling machines, horizontal boring mills and drill presses. Drill clean square holes in the hardest metal or the softest wood in one operation.

They are particularly adapted for use on steam engine parts, gasoline motors, spline shafts, universal joints, dies and tools and other work where an accurate clean square or rectangular hole must be drilled. They drill from solid metal by one operation, counterbore or cut one or more square corners in a hole already drilled. Blind holes with perfectly flat bottoms can be drilled. Drills are sharpened only on cutting lips so that they can be resharpened indefinitely without loss of accuracy, the flutes are never ground.

The collet of the driving shank contains a full floating but direct drive dog into which the drill screws; the shank of the drill is triangular in form but each side is the arc of a circle; this shank of the drill is guided by a square opening chuck which is contained in the face of the frame. The drill shank is always in contact with the chuck at four points and is allowed to oscillate by the floating drive dog. This oscillation guided by the square opening of the chuck causes the cutting edges of the drill to reach the corners of the hole being drilled.

The setting up of the machine for a job is very simple as it is only necessary to screw in the proper size drill and tighten down the chuck until the oscillation is practically noiseless. Clamping screws are provided so that when once set they will operate without further attention until it is necessary to remove or exchange the drill and will make all holes of uniform size.

There are two models of drills: model "A" leaves a fillet of radius 1/8 the hole size and model "B," 1/50 of the hole size. Standard drills are furnished in 1/16 inch sizes and are accurate to within .002 of an inch.

The milling machine attachment consists of a head, slotted for bolting to the face of the machine, with a shank for fitting into the spindle of the machine.

An oil hole is provided in front of the attachment and it is important that sufficient oil is placed in reservoir to avoid grinding of drills against the jaws of the chuck.

On the periphery of the flange of the attachment head for milling machines are index marks by which the attachment can be set so that holes can be drilled whose traverse center lines are either parallel with mark or diagonal 45 degrees with same. A scale can be added so that holes can be drilled for any angle without moving work.

The drill press head is attached to the spindle of the drill and supported by an adjustable arm fastened to the post of the machine.

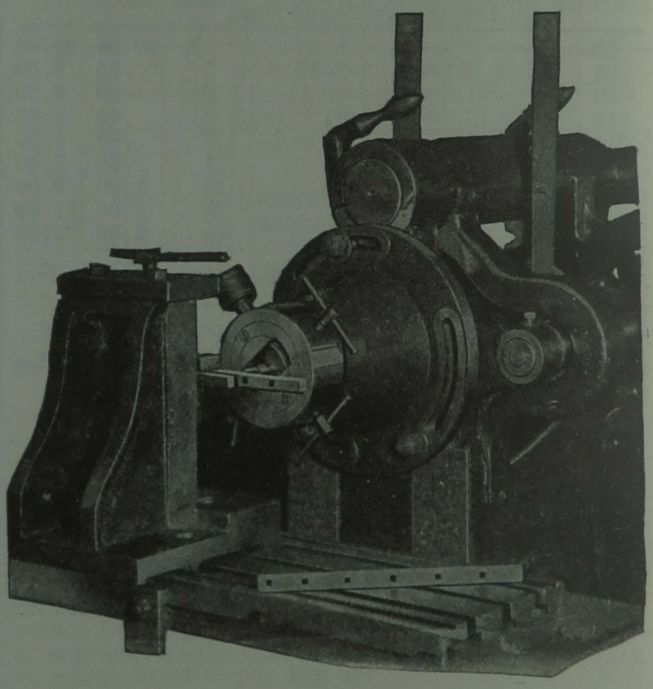


Fig. 1032
Milling Machine Type

ATTACHMENTS ONLY

NOS.	Range with Model "A" Drills. Square Holes with Round Corners Inches	Range with Model "B" Drills. Square Holes with Square Corners Inches	Weight Each Lbs.	Drill Press Type Each	Milling Machine Type Each
2	1/8 to 9/16	1/8 to 3/8	20	$200.00	.....
3	1/4 to 7/8	1/8 to 1/2	37	225.00	.....
4	1/2 to 1 3/8	3/8 to 7/8	63	.....	$250.00
5	15/16 to 2	9/16 to 1 1/4	96	.....	300.00

List of Drills on the following Page

SQUARE HOLE DRILLS

RADBORE

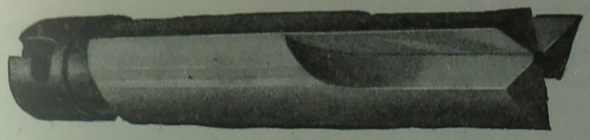


Fig. 1033

Model "A" Drills give a fillet of radius ⅛ the hole size.

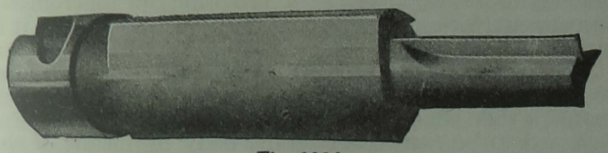


Fig. 1034

Model "B" Drills give a fillet of radius 1/50 the hole size.

Size Ins.	For No. 2 Head				For No. 3 Head			
	Model "A"		Model "B"		Model "A"		Model "B"	
	Carbon Each	High Speed Each	Carbon Each	High Speed Each	Carbon Each	High Speed Each	Carbon Each	High Speed Each
1/8	$5.00	$12.50	$5.00	$15.00	.....	.....	$5.00	$15.00
3/16	5.00	12.50	5.00	16.50	.....	.....	5.00	16.50
1/4	5.00	12.50	5.00	18.00	$5.00	$12.50	5.00	18.00
5/16	5.00	12.50	6.00	19.50	5.00	12.50	6.00	19.50
3/8	5.00	12.50	6.50	21.00	5.00	12.50	6.50	21.00
7/16	5.00	12.50	.....	.....	5.00	12.50	7.50	22.50
1/2	5.00	12.50	.....	.....	5.00	12.50	8.50	24.00
9/16	6.00	15.00	.....	.....	6.00	15.00	.....	.....
5/8	.....	.....	.....	.....	6.50	16.00	.....	.....
11/16	.....	.....	.....	.....	7.00	17.00	.....	.....
3/4	.....	.....	.....	.....	7.50	18.00	.....	.....
13/16	.....	.....	.....	.....	8.00	19.00	.....	.....
7/8	.....	.....	.....	.....	8.25	20.00	.....	.....

Size Ins.	For No. 4 Head				For No. 5 Head			
	Model "A"		Model "B"		Model "A"		Model "B"	
	Carbon Each	High Speed Each	Carbon Each	High Speed Each	Carbon Each	High Speed Each	Carbon Each	High Speed Each
3/8	.....	.....	$6.50	$21.00	.....	.....	.....	.....
7/16	.....	.....	7.50	23.00	.....	.....	.....	.....
1/2	.....	.....	8.50	25.00	.....	.....	.....	.....
9/16	.....	.....	9.50	27.50	.....	.....	$9.50	$27.50
5/8	.....	.....	10.50	30.00	.....	.....	10.50	30.00
11/16	.....	.....	11.50	32.50	.....	.....	11.50	32.50
3/4	$7.50	$24.00	12.50	35.00	.....	.....	12.50	35.00
13/16	8.00	25.00	13.50	37.50	.....	.....	13.50	37.50
7/8	8.25	26.00	14.50	40.00	.....	.....	14.50	40.00
15/16	8.50	27.50	.....	.....	$9.00	$27.50	15.50	43.00
1	8.75	28.50	.....	.....	9.25	28.50	16.50	46.00
1 1/16	9.00	30.00	.....	.....	9.50	30.00	17.50	50.00
1 1/8	9.25	31.50	.....	.....	9.75	31.50	18.50	53.00
1 3/16	9.50	33.00	.....	.....	10.00	33.00	19.50	57.00
1 1/4	9.75	34.50	.....	.....	10.50	34.50	20.50	62.00
1 5/16	10.00	36.00	.....	.....	11.00	36.00	.....	.....
1 3/8	10.25	37.50	.....	.....	11.50	37.50	.....	.....
1 7/16	.....	.....	.....	.....	12.00	39.00	.....	.....
1 1/2	.....	.....	.....	.....	12.50	40.50	.....	.....
1 9/16	.....	.....	.....	.....	13.00	42.00	.....	.....
1 5/8	.....	.....	.....	.....	14.00	45.00	.....	.....
1 11/16	.....	.....	.....	.....	15.00	47.50	.....	.....
1 3/4	.....	.....	.....	.....	16.00	50.00	.....	.....
1 13/16	.....	.....	.....	.....	17.00	52.50	.....	.....
1 7/8	.....	.....	.....	.....	18.00	55.00	.....	.....
1 15/16	.....	.....	.....	.....	19.00	57.50	.....	.....
2	.....	.....	.....	.....	20.00	61.00	.....	.....

Note.—Sizes not listed can be furnished to order.

MILLING MACHINE TABLE VISES

LAWSON

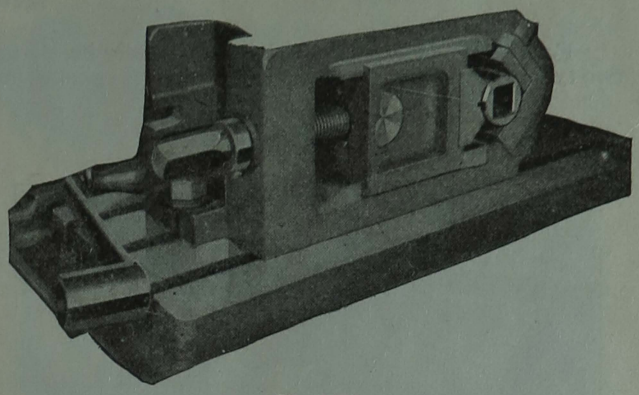


Fig. 1035

A special vise for milling machines and shapers can be supplied for holding work securely and rigidly. The jaws will hold either round, square or oblong stock. Vise is so arranged that it may be clamped to any milling machine table. This type of vise is particularly applicable to milling machines equipped with Radbore heads. A socket type crank operates the clamp screw.

	Each
NO. 3—Capacity, ¾ to 3-Inch Round; Weight Each, 50½ Lbs.	$60.00

GRINDING ATTACHMENTS

FOR RADBORE DRILLS

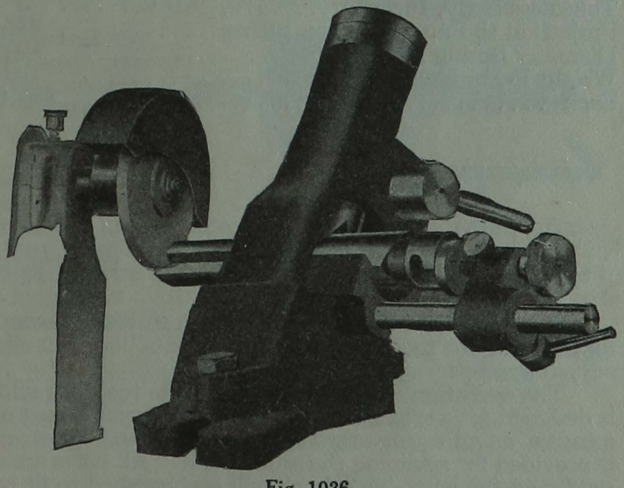


Fig. 1036

Proper sharpening of square hole drills is essential in obtaining precision. The three cutting edges must lie in a plane and meet in the center at the proper angle. This grinding attachment will hold the drills at correct angle against the grinding wheel on any ordinary grinding machines.

NOS.	1	2
Capacity Drills for Heads, Nos.	2–3	4–5
Weight Each, Lbs.	10	34½
Each	$50.00	60.00

OFFSET BORING TOOLS

LAWSON

For recessing and counterboring, especially handy for truing drilled holes or bringing them to exact size. Made in two types; for milling machines and drill press spindles and for turret lathes.

FOR MILLING MACHINES AND DRILL SPINDLES

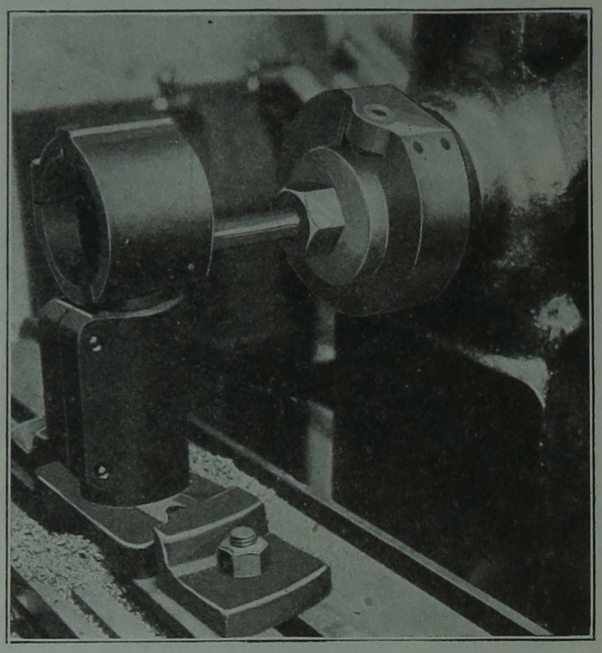


Fig. 1037

Combines extreme compactness with a wide range of adjustment for the cutting tool; an offset of 1¼ inches from center can be obtained with provision for micrometer adjustment; locking screws hold the adjustment when it is made.

The tool consists of a body block which is either threaded to the nose of the spindle or is furnished with a taper shank, a slide which holds the chuck or tool holder and is designed to be carried across the body by means of the finely threaded adjusting screw and a boring bar in which any ordinary lathe tool can be used.

The tool is held steady at any adjustment and the chattering encountered with the use of a long offset tool, is entirely eliminated; a small hexagonal chuck, consisting of a spring collet with a hexagon tightening nut, replaces the usual bulky and protruding separate chuck used on tools of this type; the indexed adjusting screw, operated by a square end wrench or key, is held by a top and bottom plate and actuates a nut fastened to the slide. The head of this screw is flush with the surface of the top plate and graduated to indicate the adjustment effected.

The head is closer coupled to the spindle than any other on the market which also insures against tendency to chatter.

All parts are carefully and accurately made of the best material, body block and top and bottom plates are gray iron; slide, index screw and nut of machinery steel; gib adjusting screw, set screws and locking nut are cut from high carbon crucible steel; boring bar of cold rolled steel.

NO.	10
Diameter Body, Inches	5 13/16
Thickness Body, Inches	3
Projection to Face of Chuck, Inches	4 3/16
Diameter Boring Bar, Inches	11/16
Weight Each, Lbs.	15
Each	$50.00

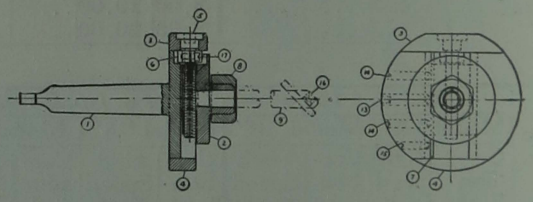


Fig. 1038

FOR TURRET LATHES

The use of an offset boring tool in a turret lathe not only effects a saving in time by doing away with the necessity for changing the tool to get a different size of bore, but allows the attainment of great accuracy by means of the graduated adjusting screw.

The operation is similar to that of the tool for milling machines as shown above. The form differs somewhat as it is designed for use in turret lathes. The movable part of the body is carried across the front of the stationary block by means of an adjusting screw operated by a hand wheel and provided with an index for fine adjustments; a clamping screw is provided for retaining the adjustment. All parts are carefully machined and accurately fitted so that the tool is held rigidly on the cut. The shank will be furnished to fit any turret lathe.

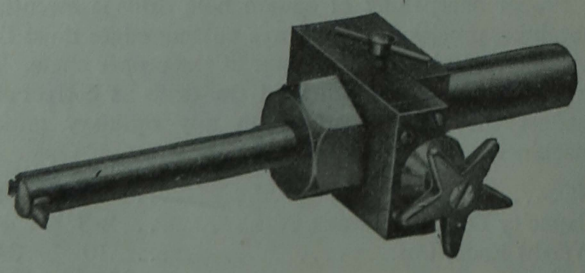


Fig. 1039

NO.	11
Length Slide Block, Inches	3 1/2
Width Slide Block, Inches	2 5/8
Projection to Face of Chuck, Inches	2 3/16
Weight Each, Lbs.	8 1/8
Each	$40.00

OFFSET BORING HEADS

CASLER

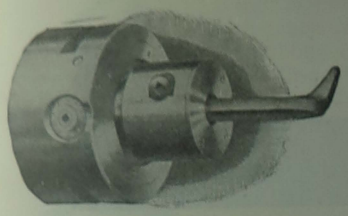


Fig. 1040
STYLE A

Combines all the essentials of a most complete tool for boring and counterboring holes to size. Rigid, compact and quickly adapted to cover a wide range of work. Designed to be threaded to nose of machine spindle, it may be mounted on a taper shank to fit the spindle, but this way of mounting is not recommended for heavy duty or when used with boring bar for long hole work.

Head consists of a cylindrical cast-iron body threaded to fit the machine spindle or a taper shank. A circular offset plate is held against the face of the body by means of the jib ring. Offset plate is threaded to receive the drill chuck or boring bar and rotates with the head, but is adjustable across its face by means of an adjusting screw which is graduated to .001 inch. Micrometer adjustment provides for any tool which may be carried by offset plate. Drill chuck is close to end of machine tool spindle providing maximum tool space between the work and the chuck. Tool shanks can extend through the drill chuck and into the hollow spindle of machine. Chuck is concentric with the machine spindle when offset plate is brought against a stop and will receive regular twist drills for starting holes.

Drill chuck will hold round, hexagon or octagon tools. Tools of special shank are unnecessary. Boring bar with inserted high speed cutters can be used in place of drill chuck. Heads are furnished unthreaded. Can be threaded and fitted with taper shank at special prices.

NOS.	30	40	60	80	100
For Spindle or Shank, Inches	1¼-3	1½-3½	1¾-5	2¼-6	2¼-7
Diameter Body, Inches	3⅞	4½	6⅛	7¾	9½
LengthBody Inches	2 13/16	3	3⅜	3 13/16	4⅛
Offset, Inches	5/16	⅜	½	⅝	¾
Capacity Drill Chuck Inches	½	¾	1	1	1½
Weight each Lbs.	10¾	16¼	34½	53	95
With chuck, Each	$42.00	$45.00	$52.00	$59.00	$75.00

BORING TOOLS

FOR CASLER BORING HEADS

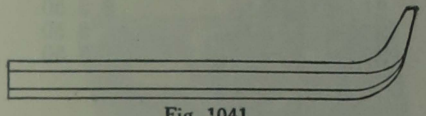


Fig. 1041

Forged from hexagon bar steel and may be reground until point reaches shank diameter. Intended for use in drill chuck of boring head.

NOS.	3A	3B	3C	3D	4E	6F
Dia. Shank, Inches	¼	⅜	⅜	½	¾	1
Will bore, Inches	5/16-1	¾-1⅝	1 1/16-2 5/16	1¾-3	2⅜-3⅞	3¼-5¼
Weight Each, Lbs.	⅛	¼	¼	⅜	1	2⅜
Each	$0.40	.60	.70	.80	1.15	1.75

Nos. 3A to 3D fit No. 30 head and larger.
No. 4E fits No. 40 head and larger.
No. 6F fits No. 60 head and larger.

ADJUSTABLE TOOL BORING BARS

FOR CASLER STYLE "A" BORING HEADS

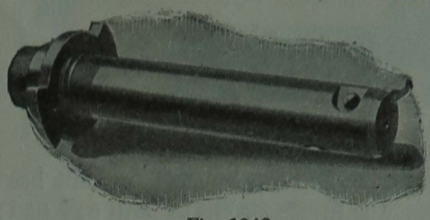


Fig. 1042

For use in Style "A" boring head. Takes the place of the drill chuck. Holes of different diameters may be bored by adjusting cutters.

NOS.	306	406	409	609	612
Fits Head No.	30	40	40	60–80	60–80
Dia. Bar, Inches	1	1	1½	1½	2
Depth Bore, Inches	6	6	9	9	12
Will Bore, Inches	1 1/16-2⅛	1 1/16-2¼	1 1/16-3⅝	1 1/16-3⅞	2 1/16-5
Weight Each, Lbs.	3	4	7¼	9¾	16
Each with, Carbon Cutter	$8.00	11.00	12.00	20.00	21.00

NOS.	615	109	112	115	118
Fits Head No.	60—80	100	100	100	100
Dia. Bar, Inches	2	1½	2	3	3
Depth Bore, Inches	15	9	12	15	18
Will Bore, Inches	2 1/16-5	1 1/16-4⅜	2 1/16-5½	3 1/16-8⅛	3 1/16-8¾
Weight Each, Lbs.	19	19	25	44½	50½
Each, with Carbon Cutter	$22.00	29.00	30.00	31.00	32.00

Price of High Speed Cutters furnished on application.

OFFSET BORING HEADS

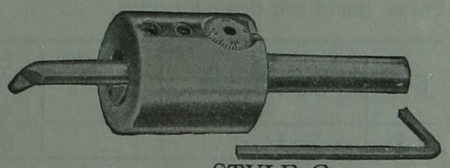


Fig. 1043—STYLE C

Of practically the same construction as style "A" but of smaller size. Chuck is replaced by a hardened "V" block and set screws for holding the tools. Block is carefully aligned so that twist drills within the range of the chuck can be brought to run true by means of the micrometer screw graduated to .001 inch. Will take tools with round or octagon shanks. Furnished complete ready for use.

Each

NO. 3C.—Diameter of Body, 1⅜ Inches; Length Body over Chuck, 1⅝ Inches; Diameter of Shank, ½ Inch; Capacity of Drills, 3/16 to ⅜ Inch; Offset, ⅛ Inch. Weight each, 1 Lb. . . . $12.00

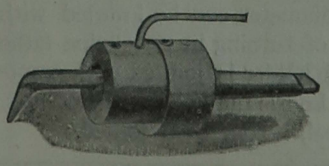


Fig. 1044
STYLE D

Consists of shank and body across which is moved a head or chuck carrying the boring tools. Offset adjustment is secured by opposing hollow set screws threaded in the body. Set for depth cut by releasing one of set screws and following up with the opposite screw. Will take tools with round or octagon shanks.

Each

NO. 6 D.—Diameter of body, 3 3/16 Inches; Length Body over Chuck, 4¾ Inches; Capacity tool shanks, ¼ to ¾ Inch; Off-set ½ Inch; Weight each 9½ pounds. $15.00

KNURLING TOOLS

Fig. 1045

This tool is self-centering and the knuckle or joint has ample bearing to resist the severe strains of both end and side thrust. In these essentials the Armstrong knurling tool is unexcelled. The knurls and pins are accurately made of tool steel suitably tempered. All other parts are drop forged or bar steel, hardened.

NO.	Size, Inches	Weight Each, Lbs.	Extra Knurls, Per Pair	Complete, Each
1-K	½x1⅛x6½	1½	$0.75	$4.50

Furnished with fine, medium or coarse knurls.
Medium sent unless otherwise specified.

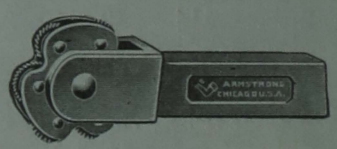


Fig. 1046

The advantages of this tool are readily apparent. Revolving head is fitted with three pairs of knurls—fine, medium and coarse—either of which can be used without the inconvenience and loss of time incident to changing knurls. Knurls and pins of tool steel, accurately hardened. Other parts are drop forgings.

NO.	Size, Inches	Weight Each, Lbs.	Extra Knurls, Per Pair	Complete, Each
3-K	½x1⅛x6½	2	$0.75	$6.00

Fig. 1047

Any desired length and diameter can be knurled with this tool after the manner of turning in an engine lathe with continuous feed. The holder is jointed with ample bearing surface so that the knurls may center themselves. Knurls and pins of tool steel, holder drop forged.

NO.	Size, Inches	Weight Each, Lbs.	Extra Knurls, Per Pair	Complete, Each
1	½x1x6	1¼	$1.20	$6.70

Furnished with fine, medium or coarse knurls.
Medium sent unless otherwise specified.

All Above, One in a Box

KNURLING TOOLS

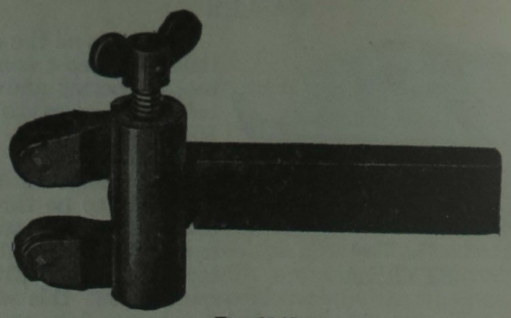


Fig. 1048

For use in engine lathe for knurling metal. The movable arms holding the knurls in connection with rocking joint have a positive opening and closing movement in parallel lines, actuated by a right and left hand screw.

	Each
NO. BJ—Space between Knurls, Maximum, 1⅜ Inches, Minimum, 3/16 Inch. Depth from center of Knurls ⅞ Inch; Size of Knurls, ¾x3/16 Inch; Size Holder, 1x½x6 Inches	$5.00
Extra Knurls, per Pair	.75

Furnished with coarse, medium or fine knurls.
Medium furnished unless otherwise specified.

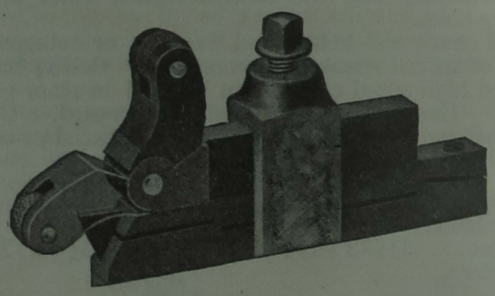


Fig. 1049

FOR SCREW MACHINES

This Tool is self centering and the knuckle or joint has ample bearing to resist the severe strains of both end and side thrust. The knurls and pins are accurately made of Tool Steel suitably tempered. All other parts are Drop Forged or Bar Steel, hardened.

Knurls can be furnished coarse, medium and fine in either straight line or Diamond pattern. Medium Diamond Knurls will be sent with tool when not otherwise specified.

NOS.	Size Shanks Inches	Each With One Knurl	Extra Knurls Each
1	2½ x 17/32 x 9/32	$ 3.50	$0.60
2	3 7/16 x ¾ x 11/32	3.50	.60
3	3 7/16 x ⅞ x ½	3.50	.60

KNURLS

Fig. 1050

Illustration shows form of fine, medium and coarse knurling.

The pitch of the knurled cut measured parallel to the axis of the work, is about 20 to the inch for fine knurls, 12 to the inch for medium, and 8 to the inch for coarse.

PLANER JACKS

Fig. 1051

For leveling work on planers, milling machines, etc. Are designed to displace the haphazard devices and methods quite generally in use for leveling work on machine tools, and a glance will show any mechanic their convenience and utility. A set of them on a machine will greatly reduce the proportion of time required for preliminary arrangements as compared with the actual machine time on the job, and will, moreover, by their perfect adjustability and solidity, insure good, true surface work.

NOS.	Height Contracted, Inches	Height Extended, Inches	Weight Each, Lbs.	Each
1	2¾	3¾	1½	$1.00
2	3¾	5¼	3	1.50
3	5¼	7½	6	2.00
4	7½	12	12	3.00

DRILL VISES

Quick Action

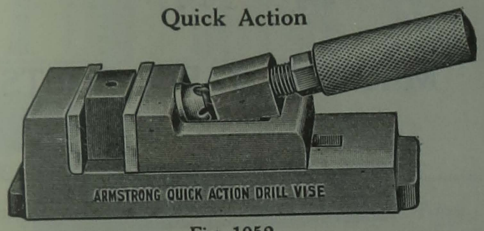


Fig. 1052

Provides a safe and convenient means of holding light work with ample leverage against the tendency to twist under strain of cut, and bottom of vise has projecting lugs at either end to facilitate clamping it to the machine when desirable. One turn of handle sets or releases the vise. It can be instantly adjusted to any size within its capacity. The sides are ground true and at right angles with the bottom. It will hold work true and solid, as the sliding jaw draws down.

NOS.	Width Jaw, Inches	Depth Jaw, Inches	Opens, Inches	Weight Each, Lbs.	Each
1V	2	15/16	1¾	4½	$6.00
2V	2¾	1 3/16	2½	8½	9.00
3V	3½	1 7/16	3	16	14.00

BOLT DRIVERS

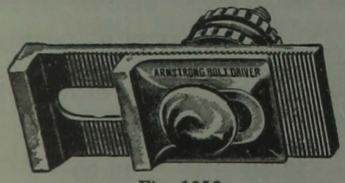


Fig. 1053

Drop forged from steel; extremely handy lathe attachment for turning square, flat or hexagon stock, especially when a number of pieces of same size are to be turned, as no adjustment, tightening or loosening is necessary when changing pieces.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
2D	2	2¼	$2.75
3D	3	5¼	4.00
4D	4	10¼	6.00

DRILL HOLDERS

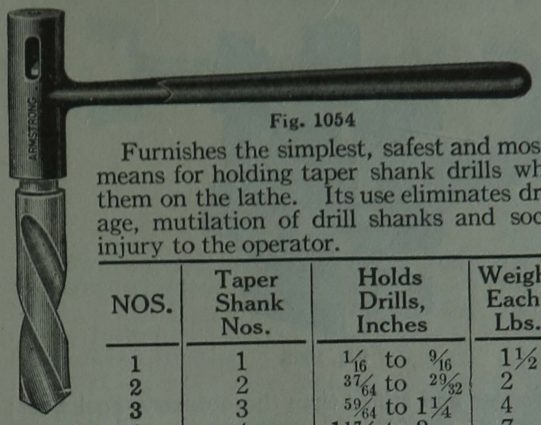


Fig. 1054

Furnishes the simplest, safest and most efficient means for holding taper shank drills when using them on the lathe. Its use eliminates drill breakage, mutilation of drill shanks and sockets and injury to the operator.

NOS.	Taper Shank Nos.	Holds Drills, Inches	Weight Each, Lbs.	Each
1	1	1/16 to 9/16	1½	$0.90
2	2	37/64 to 29/32	2	1.20
3	3	59/64 to 1¼	4	1.60
4	4	1 17/64 to 2	7	2.60
5	5	2 1/64 to 3	14½	4.00

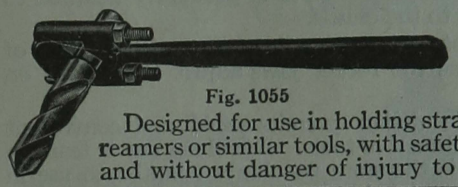


Fig. 1055

Designed for use in holding straight shank drills, reamers or similar tools, with safety to the operator and without danger of injury to the tool held.

NOS.	Capacity, Inches	Length, Inches	Weight Each, Lbs.	Each
200	¼ to 1	11	2¼	$1.20
300	⅜ to 1½	13	4	1.60
400	½ to 2	15½	7	2.60
500	¾ to 3	18	13¾	4.00

AUTOMATIC DRILL DRIFTS

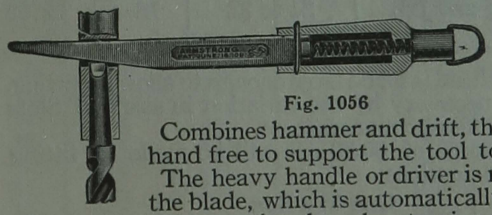


Fig. 1056

Combines hammer and drift, thus leaving one hand free to support the tool to be removed. The heavy handle or driver is mounted upon the blade, which is automatically kept extended, when not in operation, by a low tension coil spring.

The point of the blade is inserted in the slot of drill socket and the handle driven forcibly up the blade, until it strikes the butt end of drift—it will strike a blow sufficiently heavy to remove the most stubborn drill.

NOS.	Capacity MORSE Taper No.	Recommended For Shank Nos.	Weight Each, Lbs.	Extra Blades, Each	Complete, Each
1A	1, 2 or 3	1 or 2	1½	$0.40	$1.25
2A	2, 3 or 4	2 or 3	2½	.50	1.50
3A	3, 4 or 5	3 or 4	3¾	.65	2.00
4A	4, 5 or 6	4 or 5	6	1.00	3.00

VISE HOLD-DOWNS

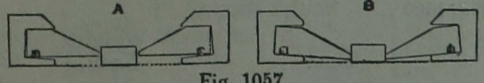


Fig. 1057

Indispensable for holding thin work; cannot spring or buckle. Vise jaw pressure on back throws fingers into contact with work, forcing same down to perfect contact with bed of vise.

	Per Pair
NO. 1—4 Inch	$3.50
NO. 2—8 Inch	$4.00

LATHE TOOL POSTS

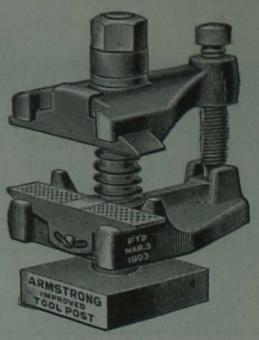


Fig. 1058

It is stronger and stiffer than the ordinary Tool Post; will not slip or chatter and consequently will do more accurate work.

As there is no side projection it is peculiarly adapted to working close up to the chuck.

It has a great range of adjustment without loss of holding power as the rocker jaws adjust themselves on parallel lines.

The open side design permits rapid and convenient change and adjustment of tools. It will not cut or tear the tool shank, and is therefore peculiarly adapted to use in connection with tool holders. The body parts and jaws are drop forged of steel, hardened, and other parts are bar steel.

NOS.	For Tools Size, Inches	For Lathes With Swing, Inches	Weight Each, Lbs.	Each
1T	½x1⅛ and less	12 to 14	5	$5.50
2T	⅝x1⅜ and ¾x1⅝	16 to 18	8½	7.00
3T	¾x1⅝ and ⅞x1¾	20 to 22	11½	9.00
4T	⅞x1¾ and 1x2	24 to 32	18	12.00

Note—Bolt head is made large enough to allow for fitting. This is made necessary by the variation in size of T Slots in lathes of different manufacture.

An extra charge of $0.50 net will be made for fitting bolt head to dimensions.

One in a Box

ANGLE OR KNEE PLATES

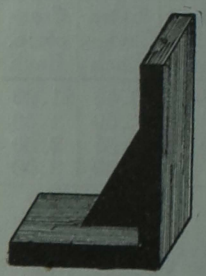


Fig. 1059

For planers, milling machines, shapers, drill presses, etc., angle plates are used in all machine shops for holding work while machining that would be very difficult to fasten any other way.

Made of heavy iron castings well braced, planed and ground. Their accuracy and finish enables them to fill the requirements of the most particular shops.

NOS.	Size. Inches	Weight Each, Lbs.	Each
4	4 x 6 x 6	17	$ 6.60
6	6 x 8 x 8	25	8.26
7	8 x 10 x 10	60	13.20
10	10 x 12 x 12	100	24.00
18	8 x 8 x 18	100	24.00

Larger sizes up to 20 inches. Prices on application. Sketches should be furnished showing sizes and shapes.

PACKING BLOCKS

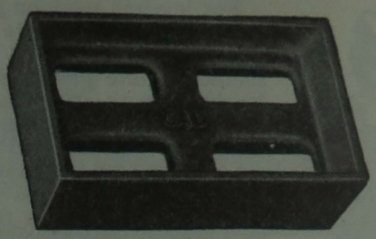


Fig. 1060

A universal Packing Block of various dimensions for tool room and machine shop use.

Disc ground on all sides to give a true surface.

Each size is designed so that it will inter-fit with other sizes, and a set of the 3, 4 and 6 inch, when used in combination, will make over 25 various heights between ⅝ of an inch and 13 inches.

Finished in Black Japan.

NOS.	Length. Inches	Width. Inches	Thickness. Inches	Center Step. Inches	Each
3PB	3	2	1	½	$0.25
4PB	4	2½	1¼	⅝	.40
6PB	6	3½	1¾	1	.60

MACHINE TABLE BOLTS

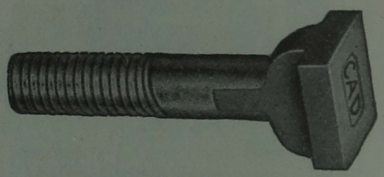


Fig. 1061

Bolts will fit any machine. Postively fitting "T" slots in machine tables without machining.

Has double offset upon the head. One part seats within the undercut groove of the machine table, the other part fits the slot. There is no such thing as the bolt turning when this bolt is used, and broken sections of machine bed or table are overcome; interchangeable and ready for use.

Bolts are serviceable—no oversize head—no machining operation is necessary.

Bolts are made of best grade material and are not to be confounded in quality with ordinary iron bolts. Threads are full size and gauged; extra operations and care is taken to make a full, smooth thread.

PRICE PER HUNDRED BOLTS WITHOUT NUTS

Length under Head. Inches	DIAMETER, INCHES ½ Inches Head. ⅞ sq. x ¼	⅜ Head Inches. 1 1/16 sq. x 5/16	½ Head Inches. 1 3/16 sq. x ⅜
2½	$12.00	$18.00	$26.00
3	13.00	19.00	28.00
3½	14.00	20.00	30.00
4	15.00	22.00	32.00
4½	16.00	23.00	33.00
5	16.50	24.00	35.00
5½	17.00	25.00	37.00
6	18.00	26.00	38.00
7	20.00	28.00	42.00
8	21.00	30.00	45.00
9	22.50	33.00	48.00
10	24.00	35.00	52.00
12	27.00	40.00	58.00

Prices quoted on application on extra lengths and ⅞ and 1-inch bolts up to 30 inches long.

MACHINE STRAP CLAMPS

Stiff, strong and convenient; drop forged from steel. For holding down work, dies, fixtures, etc., on planers, punch presses, milling machines, boring mills and drill presses.

Fig. 1062

PLAIN

NOS.	Length, Inches	Width, Inches	Thickness, Inches	Slot, Inches		Each
				Width	Length	
54	4	1 5/8	3/4	11/16	1 3/8	$0.30
56	6	1 3/4	7/8	11/16	2 1/16	.50
58	8	2 1/8	1 1/8	13/16	2 13/16	.85
59	10	2 1/2	1 3/8	15/16	3 11/16	1.40

SCREW HEEL

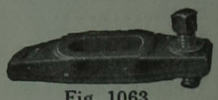


Fig. 1063

NOS.	Length, Inches	Width, Inches	Thickness, Inches	Slot, Inches		Each
				Width	Length	
54A	4	1 5/8	3/4	11/16	1 3/8	$0.55
56A	6	1 3/4	7/8	11/16	2 1/16	.85
58A	8	2 1/8	1 1/8	13/16	2 13/16	1.30
59A	10	2 1/2	1 3/8	15/16	3 11/16	2.00

Fig. 1064

GOOSE NECK

NOS.	Length, Inches	Width, Inches	Thickness, Inches	Slot, Inches		Offset, Inches	Each
				Width	L'gth		
74	4	1 3/8	3/4	11/16	15/16	13/16	$0.30
76	6	1 3/4	7/8	11/16	1 11/16	15/16	.50
78	8	2 1/8	1 1/8	13/16	2 7/16	1 1/8	.85

DOUBLE FINGER

Fig. 1065

NOS.	L'gth, Ins.	Width, Ins.	Thickness, Inches	Diam. Hole, Ins.	Fingers, In.		Each
					Diam.	L'gth	
30	3	1 1/2	5/8	11/16	1/2	1/2	$0.20
35	3 1/2	1 5/8	3/4	11/16	5/8	5/8	.25
40	4	1 13/16	7/8	13/16	3/4	3/4	.35

Fig. 1066

FINGER

NOS.	L'gth, Ins.	Width, Ins.	Thickness Ins.	Slot, Ins.		Fingers, In.		Each
				Wth.	L'gth	Dia.	L'gth	
44	4	1 3/8	3/4	11/16	1 3/8	1/2	1/2	$0.30
46	6	1 3/4	7/8	11/16	1 15/16	5/8	5/8	.50
48	8	2 1/8	1 1/8	13/16	2 9/16	3/4	3/4	.85

"U" TYPE

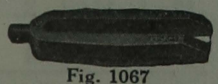


Fig. 1067

NOS.	L'gth, Ins.	Width, Ins.	Thickness, Ins.	Slot, Ins.		Fingers, Ins.		Each
				W'th.	L'gth	Dia.	L'gth	
64	4	1 3/4	3/4	11/16	3 1/2	9/16	9/16	$0.30
66	6	2	7/8	11/16	5 1/2	11/16	11/16	.50
68	8	2 3/8	1 1/8	13/16	7 3/8	13/16	13/16	.85
110	10	2 3/4	1 1/4	15/16	9	15/16	15/16	1.25
112	12	3 1/4	1 3/4	1 1/16	11	1 1/16	1 1/16	1.85

MACHINISTS' CLAMPS

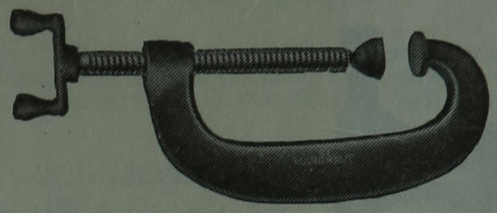


Fig. 1068

Frame, tip and handle, malleable iron; screw is steel with square thread; tip has a ball joint.

NOS.	553	554	555
Opens, Inches	5	7	10
Diam. Screw, Inches	3/4	3/4	7/8
Back to Center of Screw, Inches	3	3	5
Weight per Dozen, Lbs.	52 1/4	63	123
Per Dozen	**$24.00**	**28.00**	**32.00**

"C" CLAMPS

Drop Forged

Drop forged from steel; heavy design with long hub and extra large alloy steel screw; accurately machined.

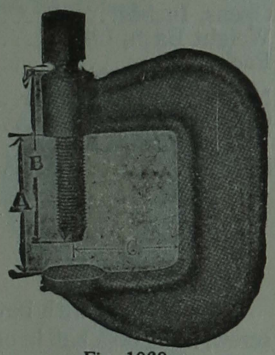


Fig. 1069

NOS.	Capacity Inches	Center of Screw to Back, Inches	Diam. Screw, Inches	Weight Each, Lbs.	Extra Screw, Each	Complete, Each
9	3/4	3/4	3/8	1/2	$0.10	$ 0.50
10	1 1/4	1 1/8	7/16	3/4	.12	.75
11	1 3/4	1 1/2	9/16	1 3/4	.16	1.25
12	2 1/4	1 7/8	11/16	3 1/2	.24	1.75
13	3 1/4	2 1/4	13/16	6	.40	2.50
14	4 1/2	2 3/4	15/16	10	.60	3.25
15	5 1/2	3 1/4	1	13 1/2	.75	4.00
16	6 1/2	3 1/2	1 1/8	18 1/2	1.00	5.00
18	8 1/2	3 3/4	1 1/4	25	1.50	7.00
20	10 1/2	3 7/8	1 1/4	30	1.75	9.50
22	12 1/2	4	1 1/4	32	2.00	12.50

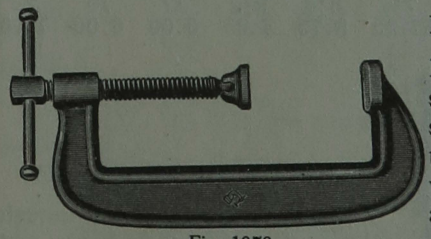


Fig. 1070

EXTRA HEAVY

Drop forged frame; screw is high-grade steel, hardened and tempered, threaded with U. S. Standard thread.

NOS.	Opens Ins.	Length Screw, Inches	Center of Screw to Back, Inches	Diam. Screw, Inches	Weight Each Lbs.	Each
2	3	5 3/4	3	13-16	6 1/2	$2.50
3	4	5 3/4	3	13-16	7	2.75
4	5	5 3/4	3	13-16	7 1/2	3.00
5	6	5 3/4	3	13-16	8	3.25
6	8	5 3/4	3	13-16	8 3/4	3.75
7	10	5 3/4	3	13-16	9 3/4	4.00
8	12	5 3/4	3	13-16	10 3/4	4.25

STEEL CLAMPS

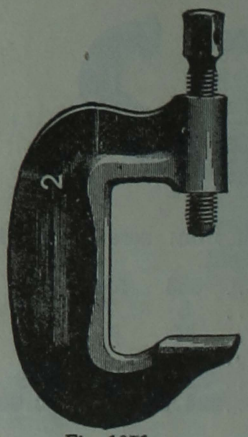


Fig. 1071

MECHANICS'

For boilermakers, blacksmiths and machinists; cast steel; foot planed; steel screws with hardened points. Distance to back from center of screw is 1½ inches.

NOS.	1	2	3	4
Opens, Inches	2	3	4	5
Weight Each, Lbs.	3	3½	4	4¼
Each	$1.25	1.50	1.75	2.00
NOS.	5	6	7	8
Opens, Inches	6	7	8	9
Weight Each, Lbs.	4½	4¾	5	5¼
Each	$2.25	2.50	2.75	3.00

HEAVY

Extra heavy, with button on end of screw, hung on a ball in order to accommodate itself to irregularities without bending the screw. The foot of the clamp is planed; the screws are made to reach the next lower number; distance to back from center of screw is 2½ Inches.

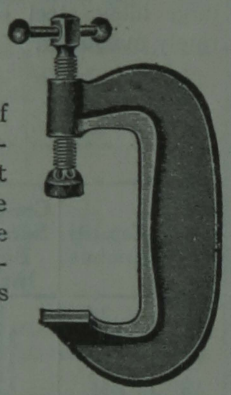


Fig. 1072

NOS.	1	2	3	4	5
Opens, Inches	2	3	4	5	6
Weight Each, Lbs.	4	5	5½	6	6½
Each	$1.75	2.00	2.25	2.50	2.75
NOS.	6	7	8	9	10	11
Opens, Inches	8	10	12	14	16	18
Wgt. Each, Lbs.	7¼	8½	9¼	17	19	22
Each	$3.25	3.75	4.25	5.00	6.00	7.00

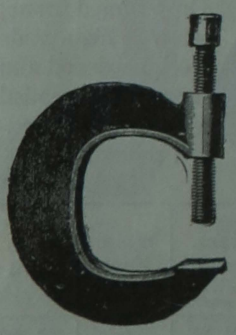


Fig. 1073

LIGHT—BOILER CLAMP

Well designed and strong enough for most uses; steel screw and ample hub length.

NOS.	0	1
Opens, Inches	2½	4
Back to Center of Screw, Inches	2½	4½
Weight Each, Lbs.	4½	9
Each	$2.00	4.00

LATHE DOGS

U. S. Standard. Steel screws, point hardened.

Fig. 1074

MALLEABLE IRON

NOS.	1	2	3	4
Size, Inches	⅜	½	¾	1
Weight Each, Lbs.	½	9/16	¾	⅞
Each	$0.30	.30	.40	.40
NOS.	5	6	7	8
Size, Inches	1¼	1½	1¾	2
Weight Each, Lbs.	1¼	1⅜	1⅝	2
Each	$0.60	.60	.90	1.00
NOS.	9	10	11	12
Size, Inches	2½	3	3½	4
Weight Each, Lbs.	2¾	3	3¾	4¾
Each	$1.20	1.30	1.40	1.60

Fig. 1075

LIGHT STEEL

NOS.	1	2	3	4	5	6
Capacity, Inches	⅜	½	¾	1	1¼	1½
Wgt. Each, Lbs.	5/16	⅜	½	⅝	1	1¼
Each	$0.35	.35	.50	.60	.75	.85
NOS.	7	8	9	10	11	12
Capacity, Inches	1¾	2	2½	3	3½	4
Wgt. Each, Lbs.	1¾	2	2½	3	4½	5
Each	$1.00	1.10	1.40	1.50	1.70	1.90

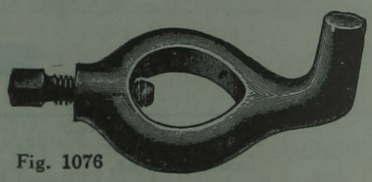


Fig. 1076

HEAVY STEEL

This dog has a very heavy boss so that a heavier screw can be used if the thread wears.

NOS.	Cap., Inches	Wgt. Each, Lbs.	Each	NOS.	Cap., Inches	Wgt. Each, Lbs.	Each
1	⅜	¼	$0.40	13	2¼	4	$1.35
2	½	½	.50	14	2½	5	1.45
3	⅝	⅝	.60	15	3	6	1.60
4	¾	¾	.60	16	3½	7	1.80
5	⅞	⅞	.70	17	4	8	2.10
6	1	1⅛	.70	18	4½	10	2.75
7	1⅛	1¼	.80	19	5	10	3.25
8	1¼	1½	.80	20	5½	15	4.00
9	1⅜	3	.95	21	6	15	5.00
10	1½	3	.95	22	7	20	6.00
11	1¾	3	1.10	23	8	23	7.00
12	2	4	1.20				

DOG WRENCHES

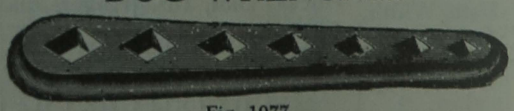


Fig. 1077

Made of steel. For both dogs and tool post.

NO. 7—Fits Screw Heads ⅜ to ¾ Inch Square. Length, 8½ Inches; Weight Each, ¾ Lb..... Each $0.75

LATHE DOGS

VULCAN

Drop Forged Steel; furnished with square head or safety set screws. **The two types of screws are not interchangeable; when ordering state which screws are desired.** Safety screw wrench furnished with safety dogs, charged extra. Screws are made of special steel hardened, tempered, have U. S. Standard thread. Screws above 1 inch diameter. have 8 threads per inch. Forgings are Black Lacquered.

STRAIGHT TAIL

Fig. 1078

Fig. 1079

Non-Safety Dogs with Square Head Screws

Fig. 1080

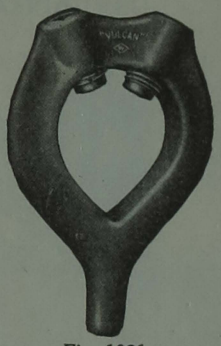


Fig. 1081

Safety Dogs and Screws

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
21	3/8	1/8	$0.50
22	1/2	1/4	.55
23	3/4	7/16	.60
24	1	3/4	.70
25	1 1/4	1 1/16	.85
26	1 1/2	1 3/4	1.00
27	1 3/4	2	1.20
28	2	2 3/4	1.40
29	2 1/2	3 1/4	1.80
30	3	6	2.30
31	3 1/2	8 3/8	3.00
32	4	9 3/4	4.50
33	5	17 1/4	8.00
*132	4	12 3/8	8.00
*133	5	18 1/2	12.00
*134	6	28	17.00

*Nos. 132, 133, 134 are extra heavy and have two screws.

BENT TAIL

Fig. 1082

Fig. 1083

Non-Safety Dogs with Square Head Screws

Fig. 1084

Fig. 1085

Safety Dogs and Screws

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
1	3/8	1/8	$0.50
2	1/2	1/4	.55
3	3/4	7/16	.60
4	1	3/4	.70
5	1 1/4	1 1/16	.85
6	1 1/2	1 3/4	1.00
7	1 3/4	2	1.20
8	2	2 3/4	1.40
9	2 1/2	3 1/4	1.80
10	3	6	2.30
11	3 1/2	8 3/8	3.00
12	4	9 3/4	4.50
13	5	17 1/4	8.00
*112	4	12 3/8	8.00
*113	5	18 1/2	12.00
*114	6	28	17.00

*Nos. 112, 113, 114 are extra heavy and have two screws.

SQUARE HEAD SET SCREWS FOR LATHE DOGS

Diam., Inches	Length, Inches	Each	Diam., Inches	Length, Inches	Each
3/16	1 1/4	$0.08	11/16	3	$0.24
3/8	1 1/4	.10	3/4	3 1/4	.27
7/16	1 5/8	.12	7/8	3 1/2	.32
1/2	2	.15	7/8	3 3/4	.35
1/2	2 1/4	.16	1	4 1/2	.50
9/16	2 3/8	.18	7/8	3 3/4	.35
5/8	2 1/2	.20	1	4 1/2	.50
11/16	2 3/4	.23	1	4 1/2	.50

SAFETY SET SCREWS FOR LATHE DOGS

Diam., Inches	Length, Inches	Each	Diam., Inches	Length, Inches	Each
7/16	5/8	$0.10	1 1/8	2	$0.43
9/16	13/16	.12	1 1/4	2 1/8	.52
5/8	1 1/16	.15	1 3/8	2 1/2	.63
11/16	1 1/4	.18	1 1/2	2 5/8	.75
3/4	1 3/8	.21	1 5/8	3 1/8	.90
13/16	1 5/8	.25	1 1/2	2 5/8	.75
7/8	1 3/4	.30	1 5/8	3 1/8	.90
1	1 7/8	.36	1 3/4	3 1/2	1.15

Extra Safety Wrenches can be furnished; prices on application.

CLAMP LATHE DOGS

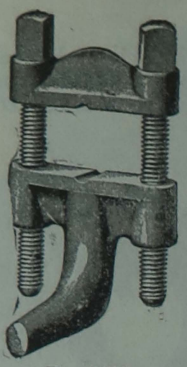


Fig. 1086

Malleable iron; heat treated steel screws.

NOS.	Capacity Inches	Weight Each, Lbs.	Each
1	1	1¼	$1.00
2	1½	1½	1.10
3	2	2	1.30
4	3	3	1.60
5	4	5¾	2.75
6	5	7	3.25
7	6	8½	4.00

"U" TYPE

Will accommodate itself readily to work of any shape and is especially adapted for use on finished work which would be liable to be damaged by the set screw of a common lathe dog. Safety sleeve nuts protect the ends of the "U" bolt. Dog can be applied without removing work from centers.

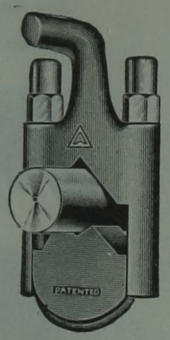


Fig. 1087

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
1-U	⅛ to ⅝	⅝	$0.65
2-U	⅜ to 1	1¾	.90
3-U	⅝ to 1½	3	1.40
4-U	⅞ to 2	4½	2.00
5-U	1¼ to 3	9½	2.90
6-U	1¾ to 4	16	4.00
7-U	2½ to 5	21	5.00

COMBINATION

Fig. 1088

This dog combines all the advantages of both the ordinary lathe dog and the toolmaker's clamp dog. While the work is held by a single screw and can be changed easily and quickly, the knurled side screws allow of its use for a large variety of diameters of work.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
118	1½	⅝	$2.50
119	2	1	3.25
120	3	2⅞	4.25

BRASS FACED

Furnished with detachable brass faces so that it can be used on soft finished or polished work, threaded pieces, or in any case where injury is liable to result from the screw.

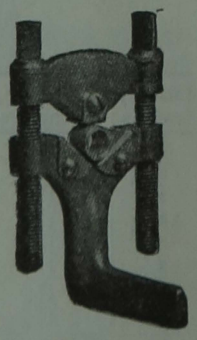


Fig. 1089

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
123	¼ to 1½	⅝	$2.50
124	¼ to 2	1	3.25
125	1¼ to 3	2½	4.25

GRINDER DOGS

STRAIGHT TAIL

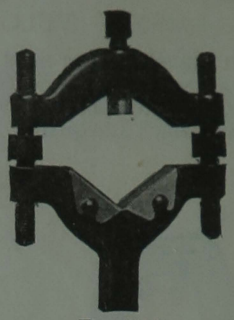


Fig. 1090

Especially adapted for use on plain grinders of the various makes and, being adjustable, each dog covers work of a number of different diameters. Work can be handled as quickly as with any single screw dog.

Brass faces and brass tipped set screws are provided so that soft finished work or threaded pieces can be handled without injury.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
105	¼ to ½	¾	$2.75
106	1¼ to 2½	1¼	3.50
107	2 to 4	2½	4.75
108	3 to 6	4¾	5.50

MILLING MACHINE DOGS AND DRIVERS

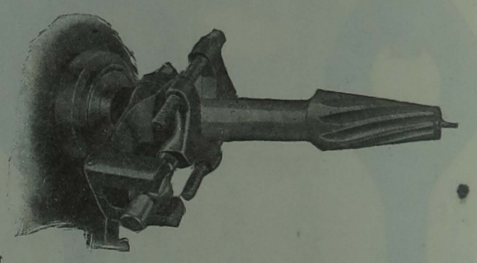


Fig. 1091

Correct spacing is assured with this dog because the ball sliding in the grooved jaw compensates for the different angles in the driver at different positions of the work. There is no binding, no cramping and no lost motion. Adapted for all kinds of work, straight, spiral or taper and odd pieces of any kind can be milled correctly without continual adjusting of the dog.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
130	¼ to 2	4¾	$20.00
132	¾ to 2¾	5	21.00

FACE-PLATE DOGS

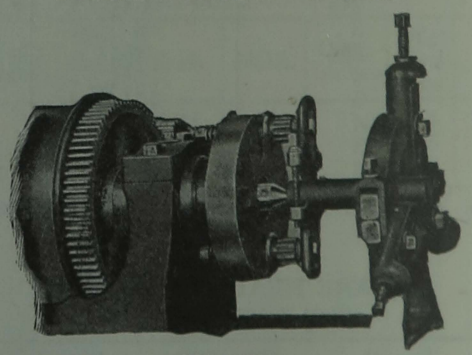


Fig. 1092

For holding work up to the head center where tail stock center cannot be used, one end of work being held in the steady rest. Does away with the necessity of strapping up a piece of work to a face-plate. Tightening set screw and loosening knurled nuts is all that is necessary to put in new work.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
140	¼ to 2	3½	$6.50
141	1 to 3½	5½	8.00

STEEL LOCKERS

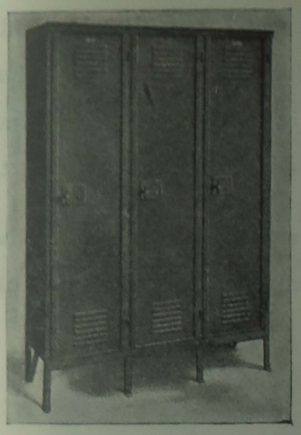


Fig. 1093

For use in shops, factories, offices, clubs and other places where wearing apparel and personal belongings have to be protected against dust, theft and fire. Furnished in dark olive green, light olive green or black enamel with gold striped doors. Can also be supplied in mahogany, grained oak and special colors at an increase in price. All lockers are built rigid so that each row maintains its alignment. Adjustable shoes compensate for floor irregularity and consequently a locker will stand level on any floor. The doors are furnished in six different designs. All lockers are shipped knocked down unless otherwise ordered.

SINGLE TIER SHEET STEEL TYPE 18 I O U²

Sheet steel lockers as illustrated above are often preferred where security from dust is more important than free circulation of air and where a general locker room is not provided. Also in banks, armories, lodges, etc., where appearance and utility are desired. Ventilation can be provided in these lockers by means of vents in the doors. Can also be furnished in double tier.

SINGLE TIER EXPANDED METAL TYPE 18 H.O.P.

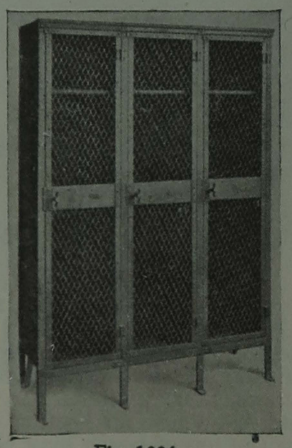


Fig. 1094

Expanded metal is a web formed from a sheet of high grade steel, cut and spread at one operation into diamond shaped meshes. There are no joints or connections as each sheet is a single piece and is therefore stiffer and stronger than woven wire of equal weight. Meshes cannot be spread apart to gain access to locker. Construction insures free circulation of air, rapid drying of damp clothing and quick and easy inspection. It is easily cleaned and fumigated.

Recommended for use where a locker room is provided and in buildings comparatively free from dust. Can be furnished in three types; expanded metal all around; side panels and doors of expanded metal and back of sheet steel; door of expanded metal with sides and back of sheet steel.

Can also be furnished in double tier.

STANDARD SIZES, SINGLE TIER

Width Inches	Depth Inches	Height Inches	Width Inches	Depth Inches	Height Inches
12	12	60, 72	18	15	60, 72
12	15	60, 72	18	18	60, 72
12	18	60, 72	18	24	60, 72
15	12	60, 72	24	18	60, 72
15	15	60, 72	24	24	60, 72
18	12	60, 72	....	....	....
		DOUBLE TIER			
12	12	36, 42	15	15	36, 42
12	15	36, 42	15	18	36, 42
12	18	36, 42	18	15	36, 42
15	12	36, 42	18	18	36, 42

Standard leg is 7 inches in the clear; 8 inches over all.

Prices on Application

STEEL STOOLS

Fig. 1095

For use in factories, etc. Made of steel with either wood or steel seats. They are comfortable and sanitary. The wood seats are laminated and will not split. The edge of the wood seat is protected by depression in steel stamping.

STYLE NO. 3

Steel Seats

Diameter Seat, Inches	12	14
Height, Inches	20–26	20–26
Per Dozen	$11.50	12.50
Diameter Seat, Inches	12	14
Height, Inches	27 up	28 up
Per Dozen	$12.00	13.00

Wood Seats

Diameter Seat, Inches	14
Height, Inches	20–26
Per Dozen	$14.00
Diameter Seat, Inches	14
Height, Inches	28 up
Per Dozen	$14.50

Standard height is 24 inches.

WITH BACKS

Any of the three leg stools can be furnished with backs.

Especially useful in candy factories, packing rooms, inspection departments and in other places where female workers are employed.

Per Dozen

Net Extra for Backs..... $4.00

Fig. 1096

Fig. 1097

WITH ADJUSTABLE LEGS

When desired, stools can be furnished with adjustable legs.

Permits an adjustment of ten inches. Four leg stools can also be furnished with non-adjustable legs and with steel or wood seats as preferred. Also made with broad backs.

Price on Application

FAIRBANKS BENCH LEGS

FOR SHOP BENCHES

The Illustration shows our method of bench construction adapted to the needs of either metal or wood workers and made with the **Fairbanks** (new and improved) **Bench Legs and Drawer Slides.**

The Bench Leg is made of the finest quality of gray iron casting, the cross-section being of T form to secure the greatest strength with minimum weight.

The illustration shows that proper provision is made for upward radiations, the hot air currents arising from steam pipes, thereby making it comfortable for the workman working at the bench.

Some classes of work require more shelf room than others, and this is provided for by lugs cast on the legs to support cross members to which the upper shelf is secured.

Lugs are also provided on the castings to form a backing for each shelf to prevent things from falling off.

The backing is entered into the lugs on an angle and then pushed back until it rests vertically on the shelf and is secured by a wire nail at the bottom. For a well-constructed bench the legs should be spaced not over six feet apart.

The Fairbanks Method of bench construction is the result of many years of practical experience in various lines of manufacturing and has proved to be convenient and practical in every way.

We do not furnish any wood parts.

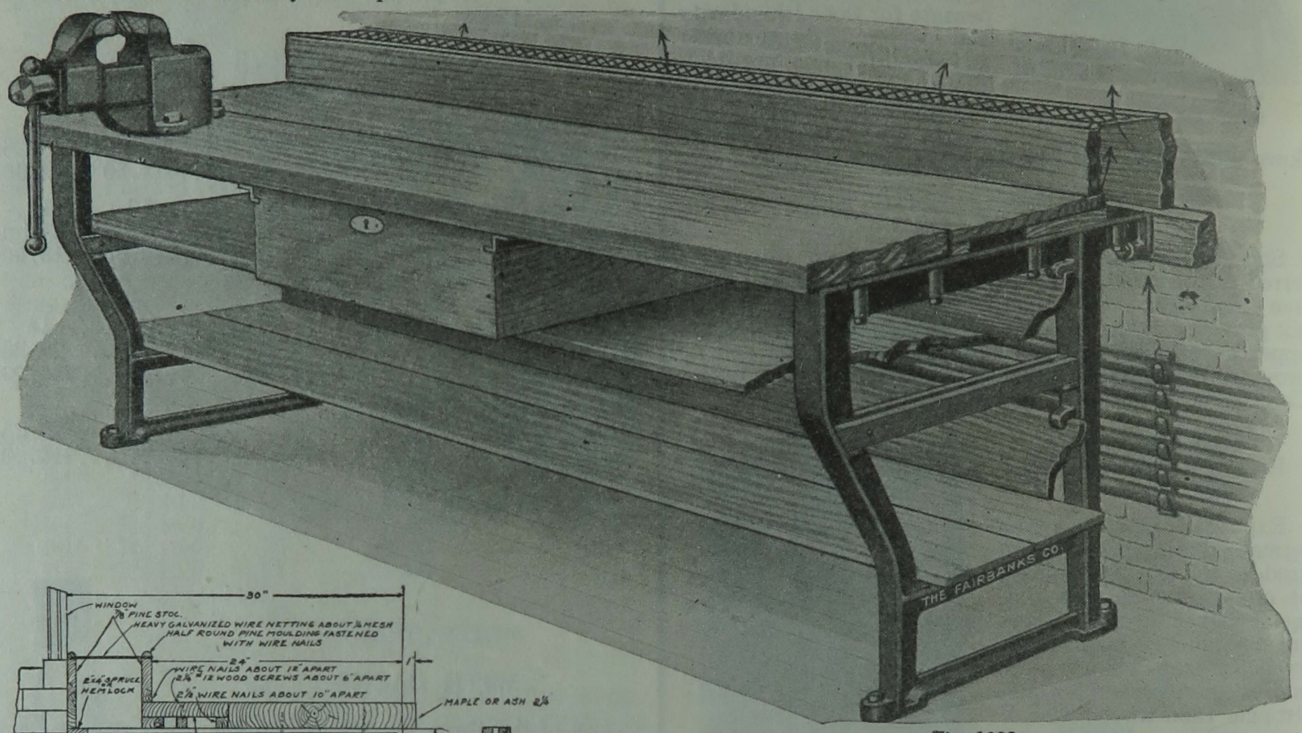


Fig. 1098

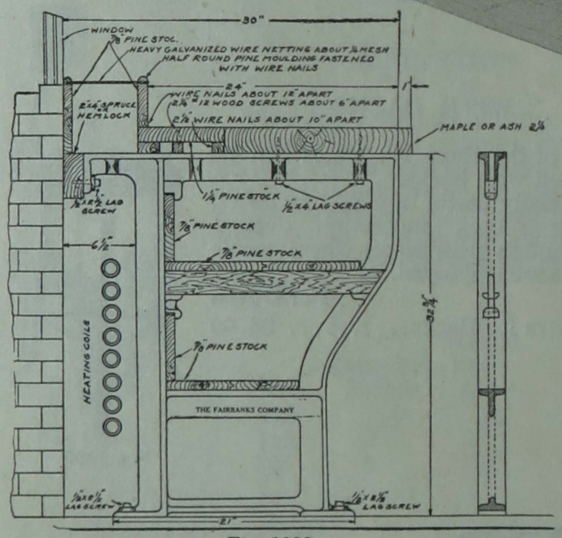


Fig. 1099

The line drawing shows the detail construction of Leg as well as specifications for lumber, bolts and nuts, lag screws, wire nails, wood screws and wire screen.

Note A—Where no heating coils or pipes are required the ledge on the top of bench may be dispensed with or a solid board may be substituted for the galvanized wire netting. The partition under bench at rear may be omitted and shelves continued back to wall.

Note B—These legs may be bolted together back to back to form a wide bench when required in the center of room or away from wall.

Note C—We can furnish cast-iron drawer slides and when legs and drawer slides are ordered in quantities, we will furnish blue prints with full working details for both the benches and drawers.

DOUBLE BENCH LEGS

These legs can also be supplied for Double Benches as shown in the illustration.

Legs for Double Benches follow the same idea in construction as for Single Leg Benches.

Details and full information will be furnished on request.

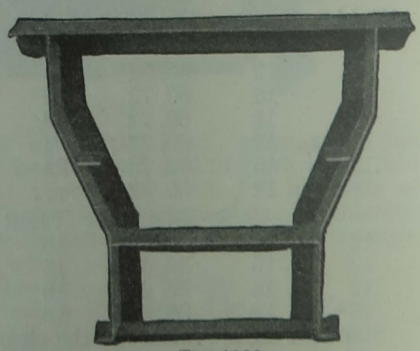


Fig. 1100

TOOL STANDS

PORTABLE

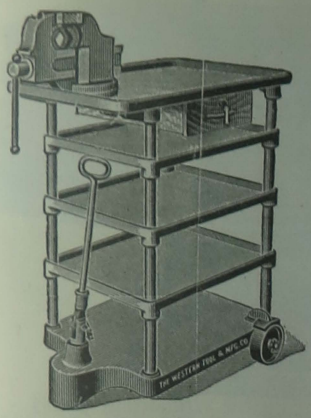


Fig. 1101

Strong enough to carry any load; easily moved; keeps tools and work together. When handle is upright the bench rests solidly on the floor; when the handle is pulled forward it throws the front wheel into operation and releases the brake from the rear wheels.

Height, 40 Inches; Top Shelf, 22x30 Inches; other Shelves, 22x24 Inches; distance between Shelves, 7 Inches; Weight without Vise, 300 Lbs.

	Each
NO. 150—All Gray Iron, with Vise	$35.00
NO. 150S—Gray Iron Base, Sheet Steel Shelves and Top	$32.00

VISE STANDS

PORTABLE

Adapted for Roundhouses, Assembling Rooms, Loom Factories, Railroad and Automobile Repair Shops. Large, heavy base. When the handle is upright the front rests solidly on the floor and brakes are applied to the rear wheels. When handle is pulled forward the front wheel is thrown into action and brakes are released from the rear wheels.

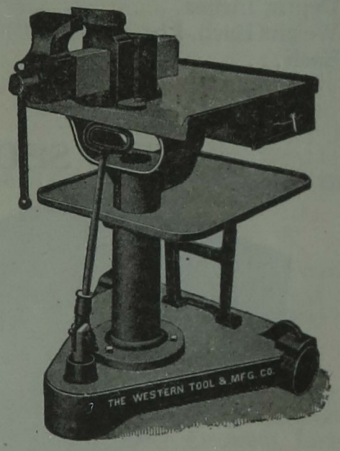


Fig. 1102

NOS. 130 to 134

Height, 44 Inches; Width Base, 26 Inches; Table and Shelf, 17x21 Inches; Weight Each, 350 Lbs.

	Each
NO. 130—4 Inch Plain Jaw Vise	$40.00
NO. 131—4 Inch Combination Pipe Jaw Vise	42.00
NO. 132—4 Inch Swivel Jaw and Base Vise	44.00
NO. 133—4½ Inch Plain Jaw Vise	42.00
NO. 134—4½ Inch Combination Pipe Jaw Vise	45.00
Stand only without Vise	34.00

NOS. 135 to 138

Height, 44 Inches; Width Base, 29 Inches; Table and Shelf, 21x25 Inches; Weight Each, 575 Lbs.

	Each
NO. 135—5 Inch Plain Jaw Vise	$62.00
NO. 136—5 Inch Combination Pipe Jaw Vise	65.00
NO. 137—6 Inch Plain Jaw Vise	70.00
NO. 138—6 Inch Combination Pipe Jaw Vise	70.00
Stand only without Vise	48.00

TOOL STANDS

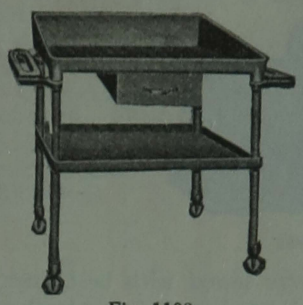


Fig. 1103

STATIONARY

For Blacksmith or Machine Shop. Made of either cast gray iron or wrought sheet steel, equipped with a drawer with lock and two racks for holding tongs, hammers or other tools.

Height 36 Inches; Shelves, 22x24 Inches; Flange of Top Shelf, 4 Inches deep at back; Weight, 150 Lbs.

GRAY IRON	Each
NO. 158—With Drawer	$18.00
NO. 158—Without Drawer	17.00
Additional Shelves	3.00

SHEET METAL	Each
NO. 158S—With Drawer	$15.00
NO. 158S—Without Drawer	14.00

Always sent with Drawer unless otherwise ordered.

STATIONARY

Made either of Cast Gray Iron or of Wrought Sheet Steel; equipped with a drawer with lock. Tool Rack not furnished.

Height, 40 Inches; Top Shelf, 22x30 Inches; other Shelves, 22x24 Inches; Distance between Shelves, 7 Inches; Weight Each, 300 Lbs.

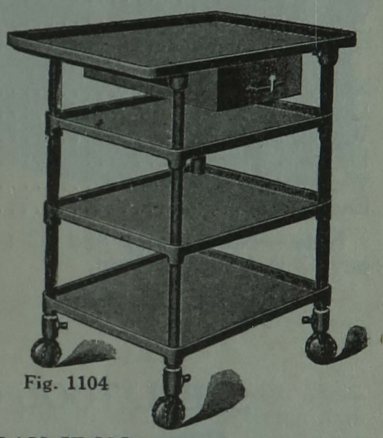


Fig. 1104

GRAY IRON	Each
NO. 152—With Two Shelves	$20.00
NO. 153—With Three Shelves	23.00

SHEET STEEL	
NO. 152S—With Two Shelves	$16.00
NO. 152S—With Three Shelves	18.00

Vises can be furnished at additional cost.

Fig. 1105

MOVABLE

The same as Nos. 152 and 152S, except that it is furnished with casters instead of ball feet.

GRAY IRON	Each
NO. 151—With Two Shelves	$20.00
NO. 151—With Three Shelves	23.00

SHEET STEEL	
NO. 151S—With Two Shelves	$16.00
NO. 151S—With Three Shelves	18.00

CANVAS TOOL BAGS

Fig. 1106

Made of 18 oz. white canvas sewed with best linen thread; frame of 12 gauge steel; hand-made russet leather handles; buckle strap has plated buckles; bottom is of waterproof board, covered on the inside with 10 oz. gray canvas. Handles, billets and buckle straps are riveted to frame by hand; large inside pocket for small tools; sides are connected with a welt; bottoms rest on five metal studs.

NOS.	10	11	12	13
Length, Inches	14	16	18	14
Width, Inches	4½	4½	4½	4½
Depth, Inches	10	10	10	10
Weight Each, Lbs.	2¼	2½	2¾	2½
Each	**$2.00**	**2.10**	**2.20**	**3.20**

NOS.	14	15	16
Length, Inches	16	18	20
Width, Inches	4½	4½	4½
Depth, Inches	10	10	10
Weight Each, Lbs.	2¾	3	3¼
Each	**$3.30**	**3.50**	**3.60**

Note.—Nos. 10, 11 and 12 are all canvas. Balance have 3 inch leather base.

STEEL TOOL CHESTS

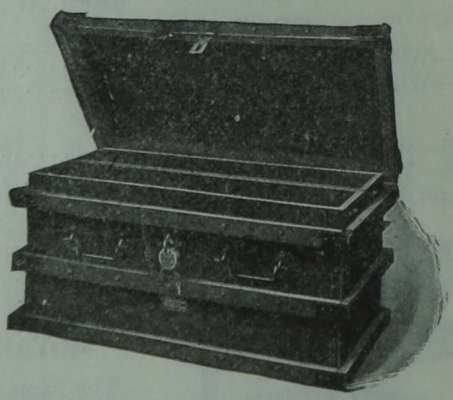


Fig. 1107

STYLE A

Made of 1/16 inch cold rolled steel; hardwood braces and malleable iron corners; fitted with wrought iron hinges and hasps; brass locks, keys and bolts to screw down cover at front corners; No. 3 and larger have handles on four sides.

NOS.	1	2	3	4	5
Length, Inches	24	30	36	42	48
Width, Inches	12	15	17	20	22
Depth, Inches	11	14	16	19	20
Weight Each, Lbs.	62	88	107	145	165
Each, With One Drawer	**$18.50**	**25.00**	**28.00**	**32.00**	**36.00**
Each, With Two Drawers	**$21.00**	**27.00**	**29.50**	**33.00**	**38.50**

STEEL TOOL CHESTS

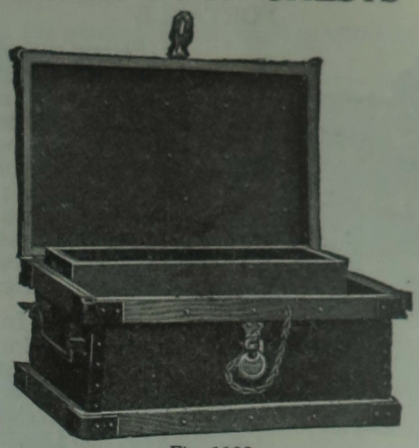


Fig. 1108

STYLE K

Made of 1/16 inch cold rolled steel; hardwood braces and malleable iron corners; fitted with wrought iron hinges and hasps; brass lock, keys and bolts to screw down cover of front corners; two corner bolts.

NOS.	1	2	3
Length, Inches	25	30	36
Width, Inches	12	12	12
Depth, Inches	12	12	12
Weight Each, Lbs.	64	70	76
Each	**$18.50**	**25.50**	**32.50**

STEEL SHOP BOXES

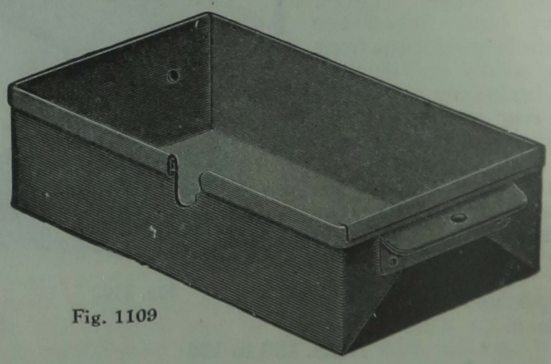


Fig. 1109

Made of various gauges of steel to meet all requirements, triple folded ends and sides; steel handles; extra strong corners.

Straight Style

NOS.	Length, Inches	Width, Inches	Depth, Inches	Gauge NOS.	Each
1	18	10	5	20	....
4	18	10	5	18	....
7	18	10	5	16	....
14	20	10	5	18	....
17	20	10	5	16	....
20	21	10	5	20	....
23	21	10	5	18	....
24	18½	9½	6	20	....
25	18½	9½	6	18	....
26	18½	9½	6	16	....

Also furnished in tapering style boxes which can be nested when empty.

Special sizes to order.

Always state size, gauge, and quantity when asking quotations.

Prices on Application

MACHINISTS' TOOL CHESTS

UNION

Fig. 1110

Selected plain oak, finished in dark golden color; sides of drawers shellacked. Fronts are of oak, bottoms are three-ply veneer, not lined. Fittings extra heavy polished nickel finish. Cylinder brass lock with 100 key changes and two flat rust-proof milled slot keys. Flush ring drawer pulls.

NO.	G
Long Drawer Length Inside, Inches	15¼
Width Drawer Inside, Inches	6
Length Outside, Inches	17
Width Outside, Inches	7⅝
Height, Outside, Inches	10¾
Weight Each, Lbs.	12½
Each	**$11.25**

Note.—Two of the drawers are ⅞ inch, one 1⅛ inches, one 1⅝ inches and one 2⅝ inches deep.

Solid mahogany drawer and till fronts; three-ply veneer bottoms, selected basswood or poplar frame, finished with finest quality of imitation leather with hard seal grain effect in black. Fitted with reinforced leather handle and leather shoulder strap. Felt lining throughout; oval mirror in till top; patented extension drawer slides which allow drawers to come out flush with till front without danger of their dropping off. Extra heavy fittings, polished nickel finish; cylinder brass hook bolt lock with 100 key changes, two flat rust-proof milled slot keys. Flush ring drawer pulls.

NO.	J
Short Drawers, Inside Length, Inches	11¾
Long Drawers, Inside Length, Inches	25
Width Drawers Inside, Inches	7
Size Till and Till Covers, Inches	26x7x3⅛
Length Outside, Inches	27½
Width Outside, Inches	8¾
Height Outside, Inches	14¼
Weight Each, Lbs.	26
Each	**$45.00**

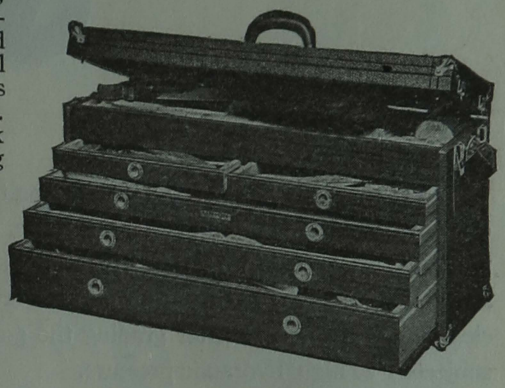


Fig. 1111

Note.—Two of the small drawers are 1⅛ inches; and two of the large are 1⅝ inches; and 3 inches deep.

Quartered oak cases, finished dark golden oak; covered cases thoroughly seasoned poplar finished with finest quality of imitation leather, with hard seal grain effect in black. Polished nickel fittings, felt lined bottoms and side of drawers shellacked. Cylinder brass lock with 100 key changes, two flat rustproof milled slot keys. Reinforced leather handle.

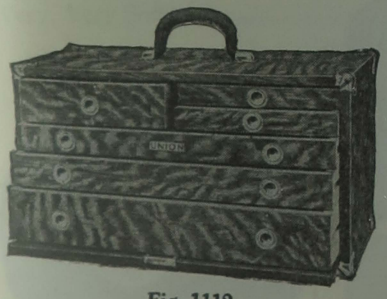


Fig. 1112

NOS.	D	DD	DDD
Short Drawers, Length, Inches	5½	7	8½
Long Drawers, Length, Inches	12¼	15¼	18¼
Width Drawers, Inches	6	6	6
Length, Inches	14	17	20
Width, Inches	7¾	7¾	7¾
Height, Inches	10¾	10¾	10¾
Weight, Each, Lbs.	11½	13	15½
Quartered Oak, Each	**$13.25**	**$14.25**	**$15.75**
Leatherette Covered, Each	.....	**15.75**	**17.00**

Note.—Two of the small drawers are ⅞ inch and 2⅛ inches deep. Large drawers are one 2⅝ inches; one 1⅝ inches, and one 1⅛ inches deep.

Selected quartered white oak, finished in dark golden color. Sides of drawers shellacked and run on hardwood slides. Fronts are of oak. Bottoms are three-ply veneer felt lined, fittings extra heavy polished nickel finish; cylinder brass lock with 100 key changes, two flat rustproof milled slot keys; flush ring drawer pulls.

Note.—Fitted with strong reinforced leather handle. No. EE with wrought heavy side lifting handles.

NOS.	E	EE
Short Drawers, Inside Length, Inches	8½	11⅜
Long Drawers, Inside Length, Inches	18¼	24¼
Width Drawers Inside, Inches	8	8
Length Outside, Inches	20	26
Width Outside, Inches	9⅞	9⅞
Height Outside, Inches	14	14
Weight Each, Lbs.	21	28
Each	**$19.00**	**20.00**

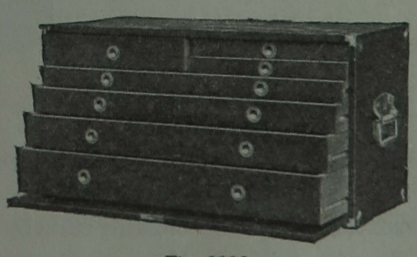


Fig. 1113

Note.—Short drawers are ⅞ and 2⅛ inches deep; long drawers are 1⅛, 1⅝, 2⅛ and 3 inches deep.

ABRASIVE WHEEL SHAPES

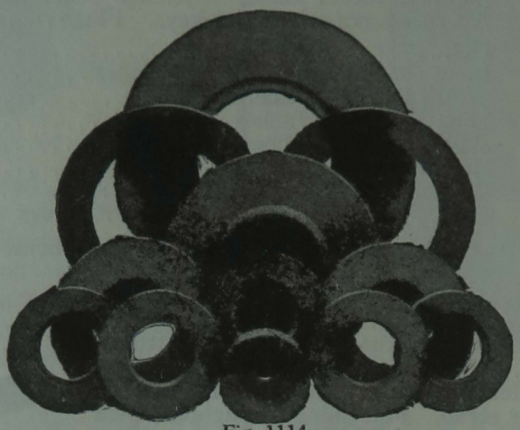


Fig. 1114

Carborundum is the trade name given to carbide of silicon, a chemical combination of the two elements, silicon and carbon. It is made in an electric furnace, coke supplying the element carbon and sand the element silicon. These materials are loaded into an electric furnace and subjected to a heat of about 4,060° F. for 36 hours. The crystal masses after being removed from the furnace are crushed to the desired sizes or grits and subjected to various purifying and cleansing treatments. After grading the grains are mixed with certain bonding agents and loaded into moulds and subjected to high hydraulic pressure.

Emery is a natural substance produced from mines and pulverized and graded. Both carborundum and emery wheels are vitrified by placing the moulds containing the mixed materials in kilns heated to a high temperature which changes the bond to a substance very similar to porcelain. The wheels are then trued to proper dimensions, bushed, graded, balanced, tested and inspected.

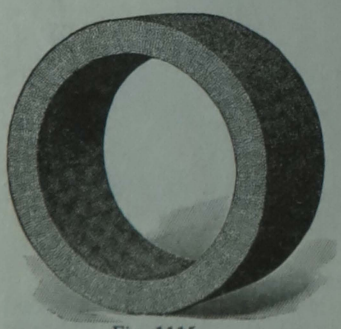


Fig. 1115

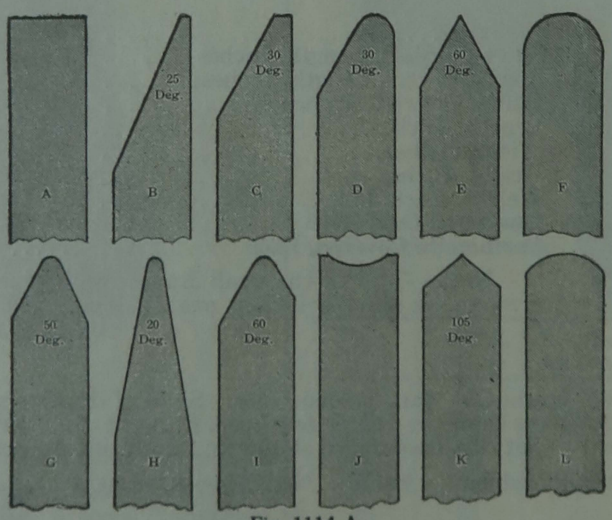


Fig. 1114-A

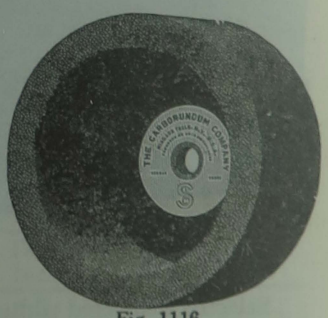


Fig. 1116

Special shaped wheels can be supplied to fit any make of grinding machines. Wheels having any of the above face forms supplied without extra charge. Round and bevel-faced wheels are used for gumming saws, grinding moulding cutters, etc. When ordering state by letter form of face wanted, otherwise a square-faced wheel will be sent; also state diameter; thickness; if cup wheels, state width over all, thickness of rim and of back or base; if cylinder, state width over all and thickness of rim; hole; material to be ground (name article); speed of wheel and whether to be used wet or dry.

ABRASIVE WHEELS

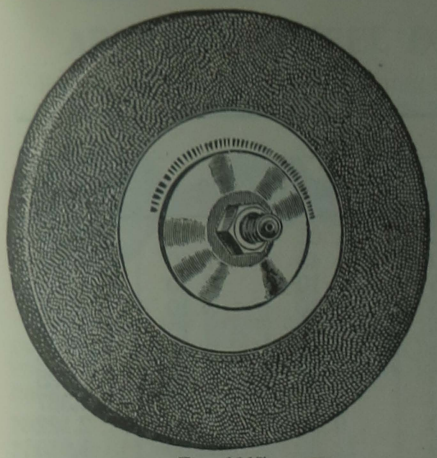


Fig. 1117
Regular

Wheels used for abrasive purposes have two principal distinguishing characteristics, either or both of which may be varied according to the class of work to be done. These are the fineness and the hardness of the wheel. Fineness is dependent upon the size of the grains of the grinding material and is commonly known as the grit. The different degrees of fineness or grits are indicated by numbers. The selection of the proper grit for any work depends on the smoothness of finish or the amount of material to be removed in a given time when finish is not important. Hardness, as the term is understood by the makers, is the quality of resistance to crumbling. The degree of hardness, called grade, is indicated by letters. The selection of grade depends upon the character of the material to be ground. A wheel which is too hard heats the work, glazes, and will not cut. If it is too soft it cuts rapidly but wears away fast. To meet all conditions to which wheels are subjected they are made in many degrees of hardness, as shown in the following tables.

CARBORUNDUM WHEEL GRADATIONS

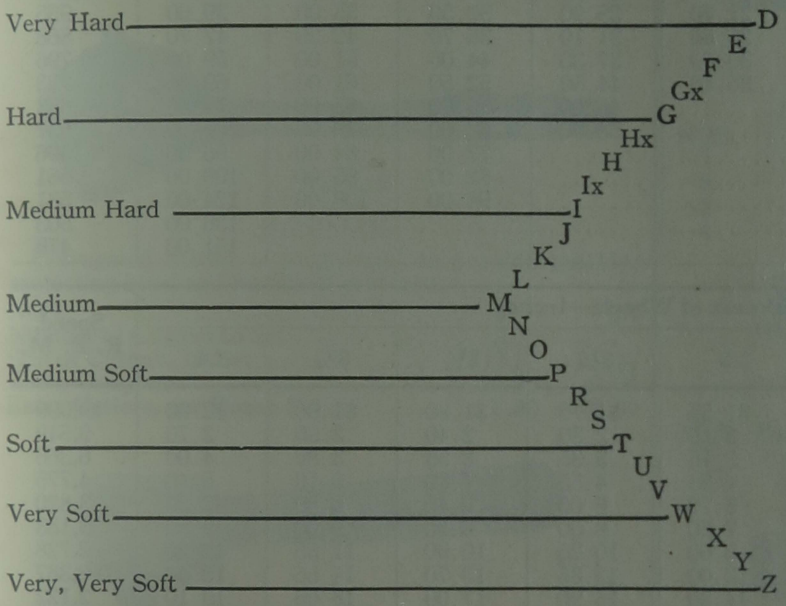


*Table of Grits and Grades for Various Classes of Grinding

Work	Grit Numbers	Grade Letters
Brass	24 to 36	I to J
Cast Iron	20 to 30	Gx to Hx
Knives	60 to 80	M
Shears	100 to 120	K to M
Tools (Large)	30 to 40	I to J
Tools (Small)	50 to 70	J to K
Rubber	24 to 36	M to N
Chilled Iron	24 to 120	O to P
General Use	30 to 40	H to J

Table shows only medium to hard.

*Above gradings are general and controlled by particular conditions. In ordering state the nature of grinding, the kind of metal, speeds, etc.

VITRIFIED EMERY WHEEL GRADATIONS

	Vitrified and Silicate Process	Elastic Process
Soft	C	½ E
	C^1	1 E
	C^2	1½ E
	C^3	2 E
Medium Soft	D	2½ E
	D^1	3 E
	D^2	3½ E
	D^3	4 E
Medium	E	4½ E
	E^1	5 E
	E^2	5½ E
	E^3	6 E
Hard	F	6½ E
	F^1	7 E
	F^2	... ..
	F^3	... ..
Extremely Hard	G	... ..

Grades C, C^1, C^2 are soft, and suitable for grinding planer knives, light surface work and roll grinding. No. 36.

Grade C^3 is for gumming saws and rough chilled roll grinding. Nos. 46 to 54.

Grade D is for grinding moulding cutters and woodworking tools generally, soft steel, mouldboards of plows, surface work on brass and iron. Nos. 20 to 60.

Grade D^1 is medium; suitable for grinding machine shop tools, tool steel, twist drills, surface work, polishing the edges of stoves—a greater variety of work than any other grade. Nos. 36 to 60.

Grade D^2 is somewhat harder than Grade D^1, and is used for rough work in machine shops on brass castings, malleable iron, soft foundry castings, ivory, horn and shell grinding. This is a fast cutting wheel. Nos. 30 to 60.

Grade D^3 is used for general grinding in foundries, heavy iron castings, malleable and wrought iron, steel castings, stove work, and sprues and gates from heavy castings. Nos. 16 to 24.

Grade E is a medium wheel, to be used on heavy iron, steel castings and edge work on iron and steel. Nos. 16 to 20.

Grade G is very hard. This wheel is made especially for plow jointing and hard steel edge grinding. Nos. 16 to 24.

ABRASIVE WHEELS

STRAIGHT WHEELS—Price Each

List applies to all straight wheels with regular face shapes.

Diameter, Inches	Thickness of Wheels—Inches								Speed, R. P. M.
	¼	½	¾	1	1¼	1½	1¾	2	
1	$0.40	$0.50	$0.60	$0.70	$0.80	$0.95	$1.05	$1.15	19,099
2	.60	.75	.90	1.00	1.15	1.30	1.45	1.60	9,549
3	.80	1.00	1.20	1.45	1.65	1.85	2.10	2.30	6,366
4	1.10	1.40	1.65	1.95	2.25	2.55	2.80	3.10	4,755
5	1.50	1.90	2.25	2.65	3.00	3.40	3.80	4.15	3,820
6	1.90	2.40	2.90	3.40	3.90	4.45	4.95	5.40	3,183
7	2.30	2.95	3.60	4.30	4.95	5.60	6.30	6.90	2,728
8	2.70	3.55	4.40	5.20	6.10	6.90	7.80	8.60	2,387
9	3.10	4.15	5.20	6.30	7.40	8.40	9.50	10.60	2,122
10	3.60	4.90	6.20	7.50	8.90	10.20	11.50	12.80	1,910
12	4.20	6.00	7.80	9.50	11.30	13.10	14.90	16.70	1,592
14	4.90	7.20	9.60	11.90	14.20	16.50	18.90	21.20	1,364
16	5.70	8.70	11.60	14.60	17.60	20.50	23.50	26.50	1,194
18	6.60	10.30	14.00	17.70	21.40	25.10	28.80	32.50	1,061
20	.....	12.30	16.80	21.40	25.90	30.50	35.00	39.60	955
22	.....	.....	20.10	25.60	31.10	36.70	42.20	47.70	868
24	.....	.....	24.00	30.60	37.30	44.00	51.00	59.00	796
26	.....	.....	.....	36.40	44.50	52.50	61.00	69.00	733
28	.....	.....	.....	.....	46.00	55.00	65.00	74.00	683
30	.....	.....	.....	.....	58.00	68.00	79.00	89.00	637
32	.....	.....	.....	.....	.....	72.00	84.00	96.00	596
34	.....	.....	.....	.....	.....	82.00	95.00	109.00	561
36	.....	.....	.....	.....	.....	94.00	109.00	124.00	531
38	.....	.....	.....	.....	.....	.....	.....	136.00	503
40	.....	.....	.....	.....	.....	.....	.....	151.00	478

Diameter, Inches	Thickness of Wheels—Inches								Speed, R. P. M.
	2¼	2½	2¾	3	3¼	3½	3¾	4	
1	$1.25	$1.35	$1.45	$1.55	$1.70	$1.80	$1.90	$2.00	19,099
2	1.75	1.85	2.00	2.15	2.30	2.40	2.55	2.70	9,549
3	2.50	2.70	2.95	3.15	3.35	3.55	3.80	4.00	6,366
4	3.40	3.70	4.00	4.25	4.55	4.80	5.10	5.40	4,775
5	4.55	4.90	5.30	5.70	6.05	6.40	6.80	7.20	3,820
6	5.95	6.50	7.00	7.50	8.00	8.50	9.00	9.50	3,183
7	7.55	8.20	8.90	9.60	10.25	10.90	11.55	12.20	2,728
8	9.45	10.30	11.15	12.00	12.85	13.70	14.55	15.40	2,387
9	11.65	12.70	13.75	14.80	15.90	17.00	18.05	19.10	2,122
10	14.10	15.40	16.70	18.00	19.35	20.70	22.00	23.30	1,910
12	18.45	20.20	22.00	23.80	25.55	27.30	29.10	30.90	1,592
14	23.50	25.80	28.15	30.50	32.80	35.10	37.45	39.80	1,354
16	29.45	32.40	35.35	38.30	41.30	44.30	47.25	50.20	1,194
18	36.15	39.80	43.50	47.20	50.90	54.60	58.30	62.00	1,061
20	44.15	48.70	53.35	58.00	62.50	67.00	71.50	76.00	955
22	53.35	59.00	64.50	70.00	75.50	81.00	86.50	92.00	868
24	65.00	71.00	78.00	85.00	92.00	99.00	106.00	113.00	796
26	77.00	85.00	93.00	101.00	109.00	117.00	125.00	133.00	733
28	83.00	92.00	102.00	111.00	120.00	129.00	139.00	148.00	683
30	100.00	111.00	122.00	132.00	143.00	153.00	164.00	174.00	637
32	109.00	121.00	133.00	145.00	157.00	169.00	181.00	193.00	596
34	123.00	136.00	150.00	163.00	177.00	191.00	204.00	218.00	561
36	139.00	154.00	169.00	183.00	198.00	213.00	228.00	243.00	531
38	153.00	170.00	187.00	204.00	221.00	238.00	255.00	272.00	503
40	170.00	189.00	207.00	226.00	245.00	264.00	283.00	302.00	478
42	.....	209.00	229.00	249.00	270.00	290.00	311.00	331.00	455
44	.....	228.00	251.00	274.00	297.00	319.00	342.00	365.00	434
46	.....	249.00	274.00	299.00	324.00	349.00	374.00	399.00	415
48	.....	271.00	299.00	326.00	353.00	380.00	407.00	434.00	397
50	.....	.....	.....	353.00	383.00	412.00	442.00	471.00	383
52	.....	.....	.....	382.00	414.00	446.00	478.00	510.00	369
54	.....	.....	.....	412.00	447.00	481.00	515.00	550.00	354
56	.....	.....	.....	443.00	480.00	517.00	554.00	591.00	341
58	.....	.....	.....	476.00	515.00	555.00	594.00	634.00	330
60	.....	.....	.....	509.00	551.00	594.00	636.00	679.00	319

Wheels of sizes not shown take list of next larger wheel.

A speed of 5,000 surface feet per minute is recommended for above wheels. Above Speed Listing gives revolutions per minute necessary for various sizes of grinding wheels to give the recommended peripheral speed in feet per minute.

Note—To obtain the weight of Vitrified wheels: square the diameter; multiply by the thickness and divide by 15. For Silicate wheels: square the diameter; multiply by thickness and divide by **13.**

ABRASIVE WHEEL DRESSERS

For truing, shaping and sharpening emery wheels without removing them from the head on which they operate.

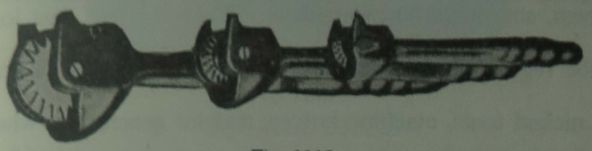


Fig. 1118

For use on the largest and hardest grinding wheels. All cutters are made of high-grade steel, hardened and toughened to give the best results; have long life and do not have to be changed frequently.

NOS.	0	1	2
Number of Cutters to Set	2	4	6
Size of Cutters, Inches	1⅛	1½	2⅜
Each, Complete	$0.75	1.50	2.00
Extra Cutters, per Dozen Sets	1.00	1.80	6.00

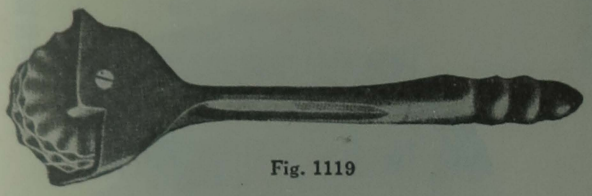


Fig. 1119

SHERMAN

Corrugated cutters of tough steel do not dull quickly; protecting hood and handle of cast iron.

NOS.	1	2
Number of Cutters to Set	3	4
Size of Cutters, Inches	1½	1¼
Each, Complete	$1.50	2.00
Extra Cutters, per Dozen Sets	1.50	3.00

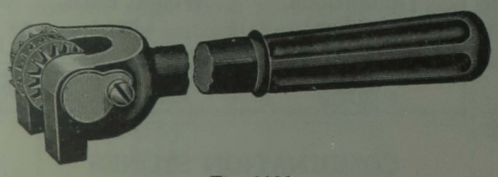


Fig. 1120

HUNTINGTON PATTERN

Japanned gray iron handle and head; tempered tool steel cutters; heavy steel screw axle.

	Each
NO.	40
Set of Cutters	2
Cutters per Set	5
Diameter Cutters, Inches	1⅛
Length Over All, Inches	12
Weight Each, Lb	1
Each	$2.50
Extra Cutters, per Set	.30

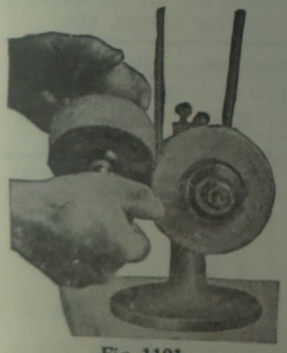


Fig. 1121

METCALF

Will turn a bevel on V edge or true up a square edge on a grinding wheel any size up to 12x1 inch, quickly and effectively; prevent chipping or breaking away of the grinding wheel.

	Each
NO. 5—Weight Each, 5 Lbs.	$5.62

ABRASIVE WHEEL DRESSERS

DIAMOND POINT

For dressing, truing and shaping emery and other abrasive wheels. Any desired shape can be given an abrasive wheel by the use of these tools. Equipped with suitable diamonds, as to grain, hardness, and shape, firmly set into the holders.

NIBS

For use in Landis, Norton, Brown and Sharpe, Pratt & Whitney and other grinders.

Fig. 1122

Fig. 1123

PRICES

$8.00, 10.00, 15.00, 20.00, 25.00, 30.00, 35.00, 40.00, 45.00, 50.00, 75.00, 100.00, 125.00, 150.00 each, depending on size and quality of diamond used in the tool.

Fig. 1124

HAND

NOS.	For Size Wheels Inches	For Grade Emery No.	Each
1	Up to 6x¾	60 and finer	$5.00
2	6x1 to 8x1½	60 and finer	8.00
3	8x2 to 10x2	60 and finer	10.00
4	10x2 and smaller	36 to 54	12.00

Fig. 1125

LATHE

NOS.	For Wheels, Inches	For Grade Emery, No.	Each
5	10x2½ to 12x2	36 and finer	$15.00
6	12x2½ to 16x2	36 and finer	18.00

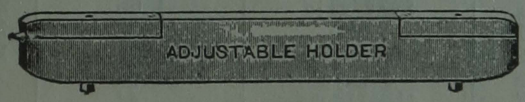


Fig. 1126

ADJUSTABLE LATHE

NOS.	For Wheels, Inches	For Grade Emery, No.	Each
7	16x2½ to 20x2	36 and finer	$20.00
*7x	16x2½ to 20x2	36 and finer	25.00
8	20x2½ to 24x2	36 and finer	30.00
9	24x2½ to 26x4	36 and finer	35.00
10	10x1 to 24x2½	Extra hard corundum	30.00
11	18x2½ to 36x4	Corundum	40.00
12	12x2 Hard and Coarse, 16, 20, 24, 30		25.00

*7x—Same as No. 7, but with large point.
State, when ordering, the style of holder wanted.

DIAMOND POINT TURNING TOOLS

Fig. 1127

Carbon, black diamond pointed tools, set with shaped points for turning paper, cotton, husk and rag calender rolls; hard and soft rubber or any material of a tough hard or gritty nature. Will turn out a large number of pieces of exact uniform size and shape.

$100.00, 125.00, 150.00, 175.00, 200.00 each and upward, depending on shape and size of diamond point.

INDIA OIL STONES

India Oilstones are made from Alundum which is made by fusing the mineral Bauxite in the intense heat of the electric furnace. The advantages of Alundum over every other abrasive material lie in its peculiar combination of hardness, sharpness and temper. By temper is meant strength of grain, and the character of its fracture under sharpening pressure. India Oilstones possess the characteristics of hardness, sharpness and toughness. They cut fast, last long and keep a better surface than any other artificial stone.

They are made in a great variety of shapes and sizes for regular and special work, and in three grits, Coarse, Medium and Fine.

Coarse Stones—For sharpening large and very dull tools, nicked tools, machine knives, and for general use where fast-cutting is required without regard to fine finish.

Medium Stones—For ordinary sharpening of mechanics' tools not requiring finishing edge. Especially recommended for tools used in working soft woods, cloth, leather and rubber.

Fine Stones—For machinists and engravers, die workers, instrument workers, cabinet makers and all users of tools requiring a very fine keen edge.

Most of the bench sizes can also be obtained in a combination of Coarse and Fine grits in one stone.

Most oilstones must be thoroughly soaked in oil before using. India Oilstones are filled with oil in the course of manufacture by a patented process. This insures a moist, oily sharpening surface, which can be maintained indefinitely by using a few drops of oil from time to time. It insures a good cutting surface by preventing the stone from filling with small steel particles and becoming glazed.

BENCH STONES

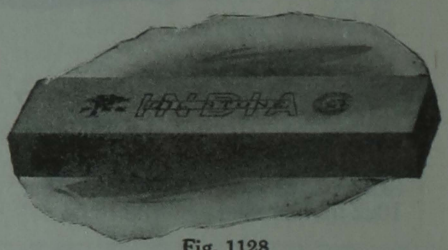


Fig. 1128

Unmounted

For carpenters' and mechanics' use in sharpening chisels, plane irons, scrapers, etc. Made in 3 grits.

Shape NOS.	Dimensions, Inches	Weight Each, Lbs.	Coarse, Medium or Fine, Each
0	8x2x1	1.50	$1.75
1	8x1¾x1¼	1.65	2.00
1½	7x2x1	1.25	1.50
2	6x1⅝x¾	.73	1.00
3	4x1x½	2.08	.60
24	4½x1½x⅝	.44	.75
29	6x2x1	1.12	1.25

Each in a Paper Box.

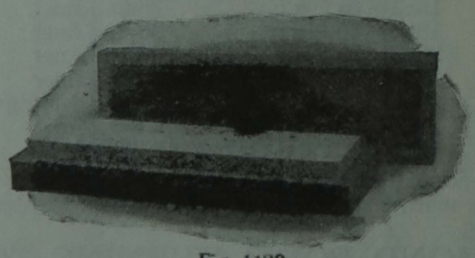


Fig. 1129

In Wood Case

Case serves to keep stone clean and in good condition, made of solid oak nicely finished.

Shape NOS.	Dimensions, Inches	Weight Each, Lbs.	Coarse, Medium or Fine, Each
0	8x2x1	2.	$2.35
1	8x1¾x1¼	2.16	2.60
1½	7x2x1	1.75	2.10
2	6x1⅝x¾	1.06	1.60
3	4x1x½	.33	1.20
29	6x2x1	1.50	1.85

BENCH STONES

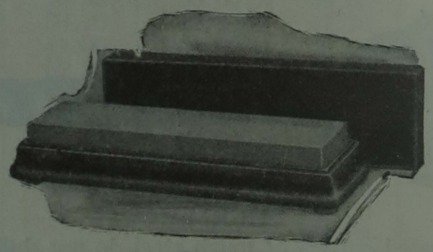


Fig. 1130

In Iron Case

Case fitted with 4 cork feet which prevent sliding on bench. Stone rests on felt which absorbs surplus oil and keeps it moist and ready for use.

Shape NOS.	Dimensions, Inches	Weight Each, Lbs.	Coarse, Medium or Fine, Each
0	8x2x1	4.5	$3.00
29	6x2x1	3.5	2.50

COMBINATION STONES

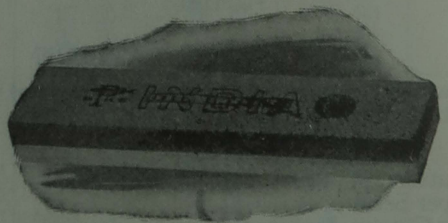


Fig. 1131

Two stones in one. Vitrified, not glued together; will not come apart. The coarse side of this stone permits rough and badly nicked tools to be brought down to an edge rapidly. The fine side can be used to put on the finishing touches. For planer and paper cutting knives, etc.

Shape NOS.	In Paper Box: Weight Each, Lbs.	In Paper Box: Each	In Wood Box: Weight Each, Lbs.	In Wood Box: Each	In Iron Box: Weight Each, Lbs.	In Iron Box: Each
0	1.6	$2.25	2.1	$2.85	4.6	$3.50
1	1.8	2.50	2.4	3.10	...	...
1½	1.9	2.00	2.3	2.60	...	...
2	.8	1.35	1.2	1.95	...	...
3	.2	.85	.3	1.45	...	...
24	.5	1.00	...	....	...	...
29	1.2	1.75	1.6	2.35	3.7	3.00

These stones have same dimensions as bench stones.

INDIA OIL STONES

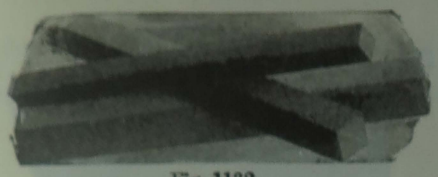


Fig. 1132

SQUARE FILES

Used for various classes of work as jewelers' and instrument makers' tools and machine shop tools. The long squares are especially useful for cleaning glass molds.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
4	4x1/2	1.6	$0.50
5	4x3/8	.8	.50
5½	4x5/16	.66	.50
6	4x1/4	.41	.50
30	6x3/8	1.3	.70
31	6x1/2	1.1	.70
32	6x5/8	3.6	.70
33	6x3/4	5.	.85
34	6x1	8.7	.85

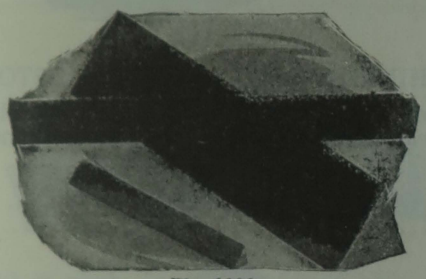


Fig. 1133

TRIANGULAR FILES

Used for the same class of work as square files, but especially useful for watchmakers' and shoe machine tools.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
7	4x1/2	.6	$0.65
8	4x3/8	.45	.65
8½	4x5/16	.33	.65
9	4x1/4	.16	.65
64	6x1/2	1.1	.85
65	6x5/8	1.6	.95
66	6x3/4	2.6	.95
67	6x1	2.9	1.10

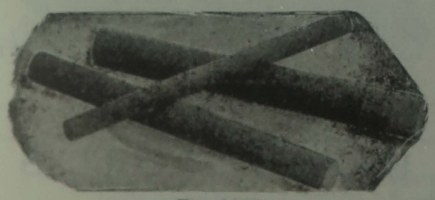


Fig. 1134

ROUND FILES

For sharpening curved cutting edges. Especially useful for machine shop dies, molder knives, bread planers, channel knives, gauges and instrument makers' tools.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
10	4x1/2	1.3	$0.70
11	4x3/8	.7	.70
11½	4x5/16	.5	.70
12	4x1/4	.3	.70

The above stones furnished in coarse, medium or fine grit at same price.

INDIA OIL STONES

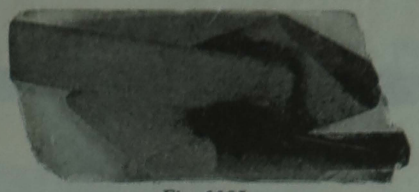


Fig. 1135

ROUND EDGE SLIPS

For dies, molder knives, head planers, channel knives, gauges, auger bits and all curved cutting edges.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
13	4½x1¾x½x3/16	.27	$0.75
14	4½x1¾x3/8x1/8	.25	.75
15	4½x1¾x¼x1/16	.15	.75
20	4x1x7/16x3/16	.15	.65
22	4½x2⅛x5/8x5/16	.37	1.00
22½	6x2¼x¾x3/8	.66	1.25
41	5x1x5/16x3/32	1.5	.70

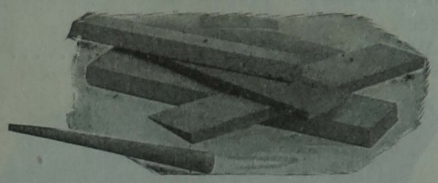


Fig. 1136

MISCELLANEOUS SHAPES

Nos. 23, 25, 56, 56½ are used for touching up shoe machine tools, needles, rough rounders, etc., also for reamers.

Nos. 26, 27, 28 are used by engravers for mold and die work, also by watch and clock makers.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
23	3½x¾x3/16x1/8	.6	$0.50
25	4½x1x5/16	1.8	.50
26	4x9/16x3/16	.4	.90
27	3x5/16	.2	.90
28	4x1x5/8	.6	.70
56	5x1x3/16	1.3	.55
56½	6x1x¼	2.	.85

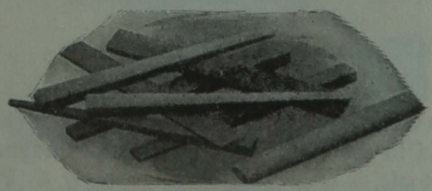


Fig. 1137

SILVERSMITHS' STONES

For fine mold and die work.

Shape NOS.	Dimensions, Inches	Weight Each, Ounces	Each
43	4x1/2x1/16	.02	$0.85
44	4x1/2x1/4x5/16x1/8	.03	.85
45	4x5/16x3/16x5/16x1/16	.02	.85
46	4x1/2x1/4x5/16x1/8	.04	.85
47	4x1/2x3/16x3/16x1/16	.03	.85
48	4x3/8x3/16x1/8x1/16	.02	.85
49	4x7/16x3/16x1/8	.04	.85
50	3½x7/16x3/16	.04	.85

The above stones furnished in coarse, medium or fine grit at same price.

INDIA OIL STONES

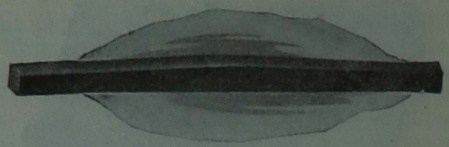


Fig. 1138

GENERAL PURPOSE STONES

Used by last makers and woodworkers, also for sharpening cutting dies in shoe and glove shops.

	Each
NO. 16—Dimensions, 8⅝x⅝ Inch; Weight Each, 29 Lbs.	$1.10

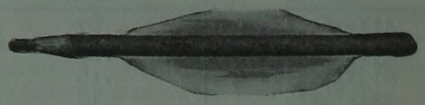


Fig. 1139

ENGRAVERS' PENCILS

Consists of two small India files, one medium and the other fine, mounted in wooden case or pencil. Used by all engravers.

	Each
NO. 19—Weight Each, 5 ounces	$0.65

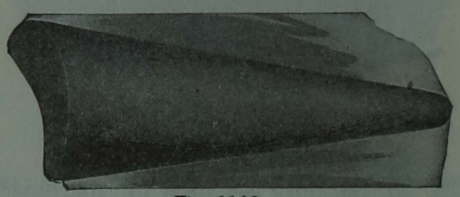


Fig. 1140

SPECIAL GAUGE SLIPS

For gauges and all curved cutting edges; also for outside curved surfaces and for cutting dies in shoe and glove factories. Made in special fine only.

	Each
NO. 21—Dimensions, 6x2x1x⅜x3/16 Inch; Weight, 43 Lbs.	$1.50

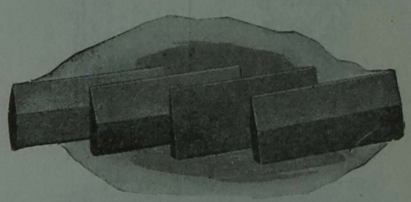


Fig. 1141

CARVING TOOL SLIPS.

For carvers of wood and ivory, engravers, metal chasers, etc. Sold in set of four different shapes adapted for all carving tools.

	Per Set (4)
NOS. 36 to 39—Dimensions, 2¼x⅞x3/16 Inch; Weight per Set (4) 2 Ounces	$2.00

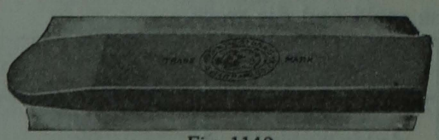


Fig. 1142

AMAZEEN STONES

Designed for sharpening knives on Amazeen skiving machines. Can be used for other shoe shop tools.

	Each
NO. 42—Dimensions, 4x1x¼ Inch; Weight Each, 1.4 Ounces	$0.65

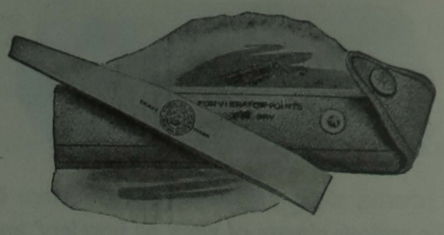


Fig. 1143

AUTO AND AUGER BIT STONES

For touching up contact points of vibrator coils and on make and break mechanism of the magneto; will also sharpen auger bits. With or without leather case.

	Each
NO. 53—Weight Each ½ Lb., With Case	$0.80
NO. 53—Without Case	.65

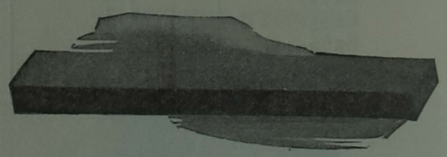


Fig. 1144

MACHINISTS' SPECIAL JOINTER STONES

Adapted for sharpening lathe and planer tools, milling cutters, reamers and drills, also jointing machines.

	Each
NO. 68—Dimensions, 4½x¾x5/16 Inch; Weight, 13 Lbs.	$0.50

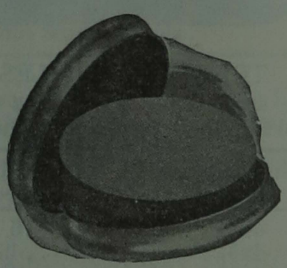


Fig. 1145

CIRCULAR COMBINATION STONES

Designed for tools requiring straight edges. Presents breadth of surface which eliminates hollowing out and constant wear in one spot. With or without felt lined steel box.

	Each
NO. 63—Dimensions 4x1 Inch; Weight Each, in Box 1.98 Lbs.; Without Box, 1.31 Lbs. With Box	$3.00
NO. 63—Without Box	2.00

ENGRAVERS' CHUCKS

Fig. 1146

This neatly finished chuck presents a convenient method for holding India pencil points used by engravers, metal workers, instrument makers and die sinkers. Points are put up in boxes of one dozen, assorted four each, coarse, medium and fine or all one grit if desired.

NO. 68—Engravers' Chuck, Each	$1.00
NO. 96—Points 1x⅛ Inch, Per Dozen	1.45

The above stones furnished in coarse, medium or fine at same price, except as otherwise stated.

OIL STONES

ARKANSAS

Made of carefully selected high grade Arkansas Rock. Prepared for commercial purposes in two grades, hard and soft. The keen cutting edge imparted by the hard grade makes it particularly desirable for use with engravers' tools, surgical instruments, etc. Soft grade is not as fine grained, but cuts faster. For wood-working tools, knives, etc.

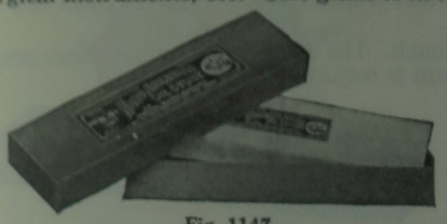


Fig. 1147

BENCH STONES

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3	2¾-3½x2x¾-1	.65	$1.35	$0.55
4	3¾-4½x2x¾-1	.75	2.00	.85
5	4¾-5½x2x¾-1	.90	3.00	1.25
6	5¾-6 x2x¾-1	1.02	4.75	2.00
7	6¾-7 x2x¾-1	1.3	5.75	2.75
8	7¾-8 x2x¾-1	1.8	6.75	3.25

One in a Box

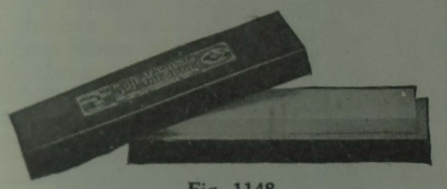


Fig. 1148

Supplied in nicely finished hardwood case.

MOUNTED

Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3½x1	.25	$1.00	$0.65
4x1½	.75	1.65	1.00
5x2	1.06	2.65	1.30
6x2	1.2	3.50	1.75
7x2	1.6	4.00	2.00
8x2	1.9	4.75	2.75

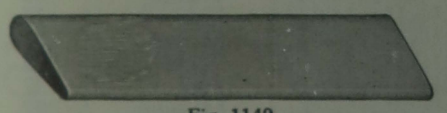


Fig. 1149

ROUND EDGE SLIPS

Regular Assortment

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3	2¾-3½x1¾-2x¼-⅜x1/16-⅛	.1	$0.90	$0.40
4	3¾-4½x1¾-2x⅜-½x⅛-3/16	.16	1.25	.60
5	4¾-5½x1¾-2x⅜-½x⅛-¼	.25	1.75	1.00

Small Assortment

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3	2¾-3½x1¼-1½x¼-⅜x⅛	.01	$0.60	$0.35
4	3¾-4½x1¼-1½x¼-⅜x⅛	.02	.90	.45
5	4¾-5½x1¼-1½x¼-⅜x⅛	.16	1.25	.60

One-half Dozen in a Box

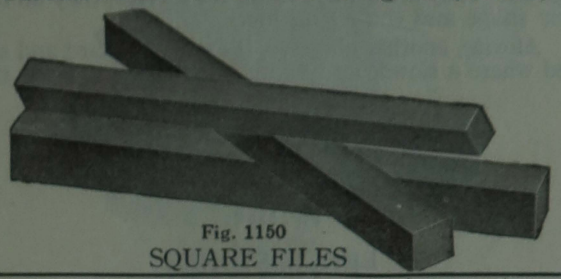


Fig. 1150

SQUARE FILES

Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3-4x¼-⅜	.01	$0.35	$0.25
3-4x¼	.01	.35	.25
3-4x5/16	.04	.35	.25
3-4x⅜	.8	.50	.35
3-4x½	.1	.60	.50
4-5x⅝	.18	.90	.60
4-5x¾	.19	1.20	.90
4-5x1	.43	1.80	1.20
5½-6x¾	.22	2.35	1.50
5½-6x1	.51	3.00	2.00

One Dozen in a Box

JEWELERS' STONES

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
4	3¾-4½x2x⅜-½	.3	$1.35	$0.65
5	4¾-5½x2x⅜-½	.4	2.25	1.00
6	5¾-6½x2x⅜-½	.5	3.00	1.50

PENKNIFE STONES

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Hard, Each	Soft, Each
3	3x1x¼-⅜	.04	$0.30	$0.20
4	4x1x¼-⅜	.1	.60	.35
5	5x1x¼-⅜	.17	1.20	.60

Special sizes cut to order, prices on application.

WASHITA

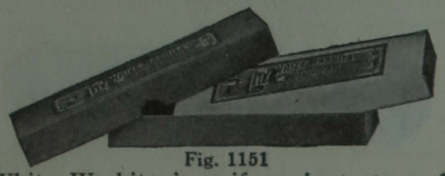


Fig. 1151

Lily White Washita is uniform in texture, free from foreign substance, and is nicely finished. Rosy Red has coarser grit and is faster cutting.

Size NOS.	Dimensions, Inches	Weight Each, Lbs.	Lily White or Rosy Red, Each
4	3¾-4x2x¾-1	.6	$0.35
5	4¾-5x2x¾-1	.7	.50
6	5¾-6x2x¾-1	.9	.75
7	6¾-7x2x¾-1	1.2	.85
8	7¾-8x2x¾-1	1.3	1.00
9	8¾-9x2x¾-1	1.4	1.20

Special sizes of Washita cut to order. Prices upon application.

Above, One in a Box

SHARPENING STONES

CARBORUNDUM

Carborundum is an artificial abrasive, a combination of the two elements silicon and carbon fused in an electric furnace. It is exceedingly hard and sharp. Carborundum stones cut the edge on the tool; they do not merely rub the edge on. They are always ready for service; they do not fill or glaze when properly used. They cut clean and fast, hold their shape and show long life.

Aloxite, another abrasive, is extremely hard and sharp and very tough. The Aloxite sharpening stones are generally used where a slower cutting and harder grade stone than Carborundum is required.

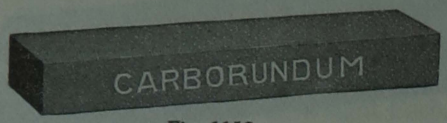


Fig. 1152

BENCH STONES

Clean, quick cutting, uniform of grit, and will hold shape and show long life. Can be used dry or with water or oil. Are quite porous, and may be tempered in their cutting by filling with vaseline.

NOS.	Dimensions, Inches	Grade	Wgt. Each, Lbs.	Each
115	8x2 x1	Fine	1.50	$1.75
116	8x2 x1	Medium	1.50	1.75
117	8x2 x1	Coarse	1.50	1.75
118	8x2 x 3/4	Fine	1.3	1.50
119	8x2 x 3/4	Medium	1.3	1.50
120	8x2 x 3/4	Coarse	1.3	1.50
121	6x2 x1	Fine	1.12	1.25
122	6x2 x1	Medium	1.12	1.25
123	6x2 x1	Coarse	1.12	1.25
124	6x2 x 5/8	Fine	.8	1.00
125	6x2 x 5/8	Medium	.8	1.00
126	6x2 x 5/8	Coarse	.8	1.00
130	6x1 1/2x 1/2	Fine	.61	.75
131	6x1 1/2x 1/2	Medium	.61	.75
132	6x1 1/2x 1/2	Coarse	.61	.75
133	7x2 x1	Fine	1.25	1.50
134	7x2 x1	Medium	1.25	1.50
135	7x2 x1	Coarse	1.25	1.50
136	5x2 x 5/8	Fine	.5	1.00
137	5x2 x 5/8	Medium	.5	1.00
138	5x2 x 5/8	Coarse	.5	1.00
142	4x1 3/4x 1/2	Fine	2.11	.75
143	4x1 3/4x 1/2	Medium	2.11	.75
144	4x1 3/4x 1/2	Coarse	2.11	.75
145	4x1 x 1/4	Fine	2.1	.50
146	4x1 x 1/4	Medium	2.1	.50
147	4x1 x 1/4	Coarse	2.1	.50

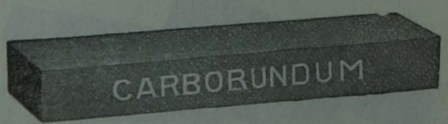


Fig. 1153

EXTRA HARD, EXTRA FINE STONE

Made for all tools requiring an extra fine edge. Wood workers and wood carvers will find it the fastest and keenest edge-producing stone they could use.

NOS.	Size, Inches	Wgt. Each, Lbs.	Each
156	8x2x1	1.55	$1.75
157	8x2x 3/4	1.52	1.50
158	6x2x1	1.15	1.25
159	6x2x 5/8	1.13	1.00
154	Slip, 4 1/2x2 1/8x5/8-5/16	.39	1.00
155	Slip, 4 1/2x1 3/4x1/2-3/16	.23	.75

These stones are also made in Aloxite: same sizes and prices.

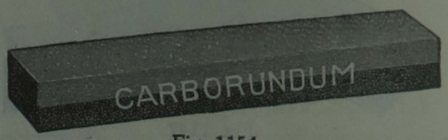


Fig. 1154

COMBINATION BENCH STONES

Made with one side of coarse and one side very fine grit. The coarse side can be used for bringing the dull tools to an edge; the fine side to give the required keen finished edge.

NOS.	Dimensions, Inches	Wgt. Each, Lbs.	Each
107	4	1.	$2.00
108	8x2 x1	1.6	2.25
109	6x2 x1	1.2	1.75
110	7x2 x1	1.9	2.00
111	5x2 x 3/4	.6	1.35
112	4x1 3/4x 5/8	.3	1.00
328	8x3 x1	1.9	2.50
329	9x3 x1 1/2	2.1	3.50
333	12x2 1/2x1	3.	3.00

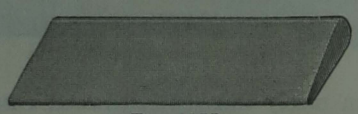


Fig. 1155

SLIP STONES

Made in five sizes and three different grits of each size. These slip stones cut rapidly and retain their shape. They are great little stones for touching up fine carving, tools, chisels, etc.

NOS.	Dimensions, Inches	Grade	Wgt. Each, Lbs.	Each
174	6 x2 1/4x3/4-3/8	Fine	.66	$1.25
175	6 x2 1/4x3/4-3/8	Medium	.66	1.25
176	6 x2 1/4x3/4-3/8	Coarse	.66	1.25
177	4 1/2x1 3/4x1/4-1/16	Fine	.15	.75
178	4 1/2x1 3/4x1/4-1/16	Medium	.15	.75
179	4 1/2x1 3/4x1/4-1/16	Coarse	.15	.75
180	4 1/2x2 1/8x5/8-5/16	Fine	.37	1.00
181	4 1/2x2 1/8x5/8-5/16	Medium	.37	1.00
182	4 1/2x2 1/8x5/8-5/16	Coarse	.37	1.00
183	4 1/2x1 3/4x1/2-3/16	Fine	.27	.75
184	4 1/2x1 3/4x1/2-3/16	Medium	.27	.75
185	4 1/2x1 3/4x1/2-3/16	Coarse	.27	.75
186	4 x1 x7/16-3/16	Fine	.15	.65
187	4 x1 x7/16-3/16	Medium	.15	.65
189	4 x1 x7/16-3/16	Coarse	.15	.65

These stones are also made in Aloxite; same sizes and prices.

IRON AND WOOD BOXES

Iron boxes are made of a good grade of cast iron, nicely finished in black. Wood boxes are made of highly finished well-seasoned chestnut.

NOS.	For Stone Size, Inches	Iron Box Without Stone Each	Wood Box Without Stone Each
1	8x2x1	$3.00	$0.60
2	6x2x1	3.00	.60
4	7x2x1	3.00	.60

MOUNTED GRINDSTONES

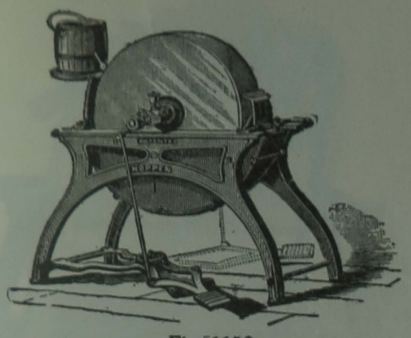


Fig. 1156
FOOT-DRIVEN

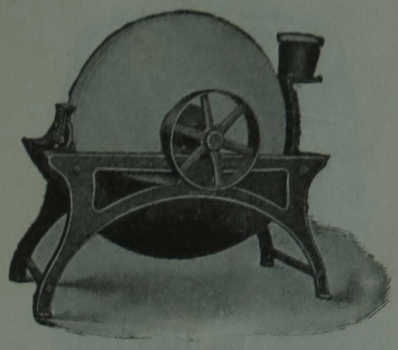


Fig. 1157
POWER-DRIVEN

The frame of these grindstones is so designed that the weight is hung central and low. All drippings drain into the trough. The selected grit stones are held firmly by powerful flanges and nuts; the shaft is turned from steel bar and hung true; has self-oiling, self-aligning journals. Legs are part of the frame; will not get loose and wobbly and frame will not tip over.

NOS.	0	0	1	1	2	2	2
Power applied by	Pulley or Treadle	Pulley and Treadle	Pulley or Treadle	Pulley and Treadle	Pulley	Treadle	Pulley and Treadle
Size of Pulley	10x2½	10x2½	10x2½	10x2½	12x3	.....	12x3
Size of Stone, Inches	24x2½	24x2½	24x3	24x3	27x3½	27x3½	27x3½
Weight Complete, Lbs	200	200	200	200	300	300	300
Each, without Stone	$15.00	$17.20	$15.00	$17.20	$24.60	$28.10	$29.60
Each, with Stone	18.25	20.45	19.60	21.80	31.25	34.75	36.25
Each, Shield Pan and Iron Bucket	1.70	1.70	1.70	1.70	2.75	2.75	2.75
Each, Hand Crank	.75	.75	.75	.75	1.25	1.25	1.25

NOS.	3	3	3	4	4	4	5
Power applied by	Pulley	Treadle	Pulley and Treadle	Pulley	Treadle	Pulley and Treadle	Pulley
Size of Pulley, Inches	12x3	.....	12x3	14x3	.....	14x3	18x4
Size of Stone, Inches	30x4	30x4	30x4	36x5	36x5	36x5	48x6
Weight, Each, Lbs	400	400	400	700	700	700	1500–1700
Each, without Stone	$26.96	$30.50	$32.00	$45.00	$51.00	$52.95	$87.70
Each, with Stone	34.60	38.00	39.50	59.25	64.65	66.60	122.00
Each, Shield Pan and Iron Bucket	2.80	2.80	2.80	3.75	3.75	3.75	6.75
Each, Hand Crank	1.50	1.50	1.50	1.75	1.75	1.75	2.50

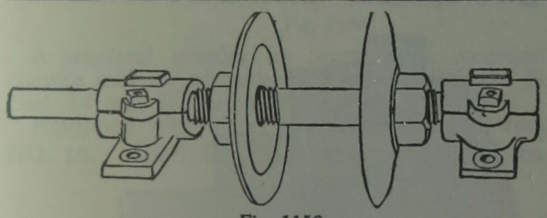


Fig. 1158

ARBORS ONLY FOR ABOVE GRINDSTONES

Turned steel shaft; cast iron flange nuts, and babbitted bearings.

NOS.	0	1	2	3	4	5
Size of Stone, Inches	24x2½	24x3	27x3½	30x4	36x5	48x8
Each	$6.50	7.00	8.00	9.50	11.50	27.00

Selected grit grindstones; frames are well constructed. The troughs are cast in one piece and bearings are babbitted. Each machine has a tool rest and cast iron pulley.

Size of Stone, Inches.	24x3	30x4	36x5	36x6	48x4	48x6	48x8
Size of Pulley, Inches.	12x2	12x3	16x3	16x3	20x4	20x4	20x4
Weight of Frame and Stone, Lbs.	260	450	750	840	1435	1725	2000
Complete, Each	$40.00	70.00	102.50	102.00	221.32	245.82	170.18

Note.—Either wheels or legs are furnished on the 48x4-inch, 48x6-inch and 48x8-inch machines at the same price. Specify when ordering these sizes whether wheels or legs are wanted.

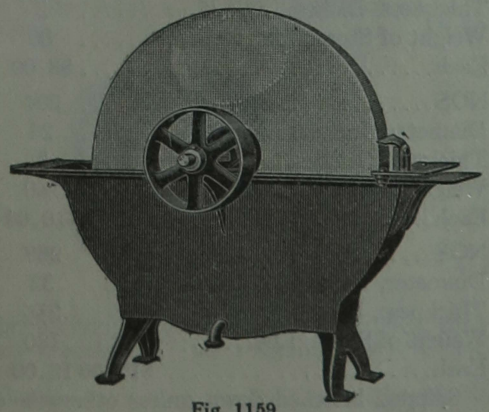


Fig. 1159

MOUNTED GRINDSTONES

Fig. 1160

WOOD FRAMES

Selected grit stones. Frames of seasoned hardwood. Legs are securely joined into the side pieces. The ends are in one piece. Two bolts at each end pass through the frame from side to side. The ends of the side bars are neatly turned to serve as handles. Roller bearings or improved ball bearings.

Furnished with treadle, crank and bucket holder. Frames shipped knocked down unless otherwise ordered.

NOS.	150	155	160
Thickness of Stone, Inches	1¾–2¼	1¾–2¼	1¾–2¼
Weight of Stone, Lbs.	100–110	70–80	40–50
Each, Roller Bearing	$6.00	5.00	4.50
Each, Ball Bearing	$7.50	5.50	5.00

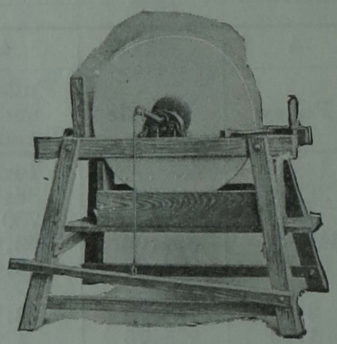


Fig. 1161

HEAVY WOOD FRAME

High grade, selected grit stones. Frame made of seasoned hardwood, with oil and varnish finish. Strongly braced in all directions. Furnished with crank, treadle, water trough and clothes protector.

NOS.	201	202	203
Diameter, Inches	24	24	26
Thickness, Inches	2	3	2½
Weight of Stone, Lbs.	80	120	115
Each	$8.00	9.00	9.50

NOS.	204	205	206
Diameter, Inches	26	28	30
Thickness, Inches	3	3	2
Weight of Stone, Lbs.	140	165	125
Each	$10.00	11.50	11.00

NOS.	207	208	209	210
Diameter, Inches	30	32	34	34
Thickness, Inches	3	2½	2	3
Weight of Stone, Lbs.	185	180	160	240
Each	$12.00	12.00	12.00	14.00

Shipped knocked down unless otherwise ordered.

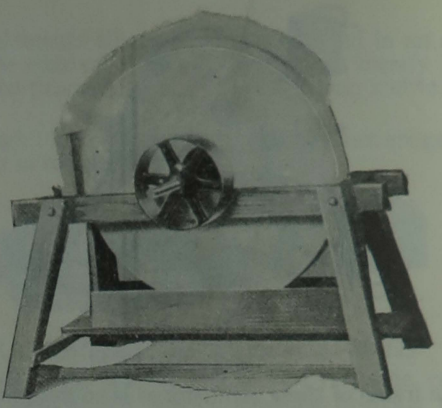


Fig. 1162

WOOD FRAME POWER GRINDSTONES

Berea grit grindstones. Frames are strongly made of seasoned hardwood, braced securely in every direction and firmly bolted together. Fitted with patent detachable fixtures. 12-inch pulley furnished, but any size can be supplied at an extra charge. Shipped mounted on skids, or knocked down as desired.

NOS.	220	225	230
Diameter, Inches	24	30	36
Thickness, Inches	3	4	4½
Each	$23.00	28.00	33.00

NOS.	235	240	245	250
Diameter, Inches	42	48	54	60
Thickness, Inches	5	6	7	8
Each	$38.00	50.00	67.00	84.00

Nos. 220, 225, 230 and 235 will hang stones 6 inches thick. Nos. 240, 245 and 250 will hang stones 8 inches thick. Weight varies according to thickness of stone used.

UNMOUNTED GRINDSTONES

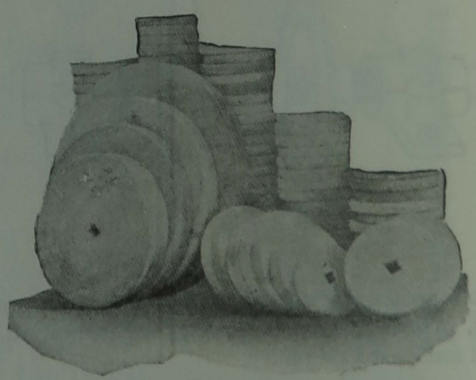


Fig. 1163

GRINDSTONES

Stones in any quantities and of suitable grits for every variety of grinding can be furnished promptly. All loose stones have square cut hole in center and are made with parallel sides. Will pile flat and firm and are not liable to breakage when stocked or stored.

Prices per Pound on Application

TOOL GRINDERS

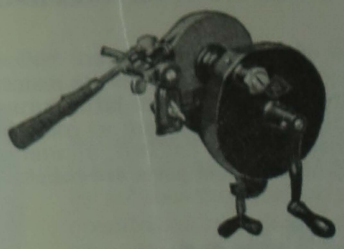


Fig. 1164

These grinders have helical cut gears, which insures a smooth, easy action. All bearings and gears are in oil-tight casing. Has combination adjustable tool rest, which may be used as a tool or hand rest or tool guide, and may be adjusted to different parts of the wheel.

NO. 14. Equipped with 4x1 inch Dimo-grit wheel; weight each, 6½ pounds..... Each $3.75

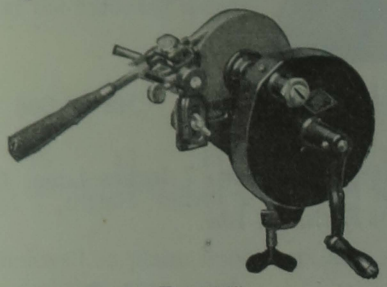


Fig. 1165

This grinder is larger than No. 14, is designed for use by carpenters, mechanics, garages and in tool kits. Equipped with wheel and improved tool rest. Each

NO. 15. Wheel 5x1 inch; weight each, 10½ lbs.. $5.25

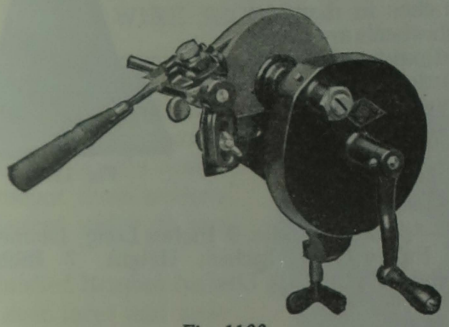


Fig. 1166

A practical grinder for carpenters, contractors, mechanics and for all around general grinding. Similar to Nos. 14 and 15, but of larger capacity.

Equipped with wheel and improved tool rest. Each

NO. 16. Wheel, 6x1 inch; weight each, 15 lbs.. $7.25

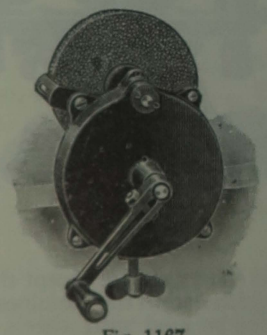


Fig. 1167

For general light grinding or for carrying in tool-kit; has cut gears; steel pinions, wide bearing and a broad base. Fully inclosed and dust proof. May be clamped to bench or table. Each

NO. 95. Wheel, 5x1 inch; weight each, 8 lbs..... $4.00

TURKISH EMERY

Fig. 1168

The best and purest grade of Turkish emery.

NOS.	1-lb. Cans	5-lb. Cans	10-lb. Cans
4 to 46, incl., per Can	$.....	.....	.....
54 to 180 incl., per Can	$.....	.....	.....
Flour, per Can	$.....	.....	.....

Made in grades Nos. 4, 6, 8, 10, 12, 14, 16, 18, 20, 24, 30, 36, 40, 46, 54, 60, 70, 80, 90, 100, 110, 120, 150, 160, 180, CF, 1F, 2F, 3F, 4F, 6F, 7F and 8F.

Can furnish above in 350-pound kegs, ½ kegs, ¼ kegs and ⅛ kegs if required.

Prices on Application

GRINDING COMPOUND

CLOVER

An efficient mixture of petroleum hard oil and an abrasive, having no magnetic properties. Melting point over 250° F. Used for grinding valves, pistons into cylinders, all kinds of tapping, running together gearing, surfacing, etc.

Fig. 1169

For manufacturers and shops, in 1-pound cans in six grades: 1A very fine; A, B, C, D and E, very coarse.

Per 1-pound Can..... $1.50

Fig. 1170

Supplied for individual use, in 4-ounce duplex cans containing two grades: "C" for roughing and "A" for finishing.

Per 4-ounce Can..... $0.50

POLISHING HEADS

Frames are made of iron with hollow bases; spindle holes reamed and counter bored; spindles and collars lathe turned, and will run accurately; provided with adjustable boxes; pulleys take flat belt, but smaller sizes are grooved so that round belt may also be used; all iron parts are finished in **red and black enamel; steel parts are polished.**

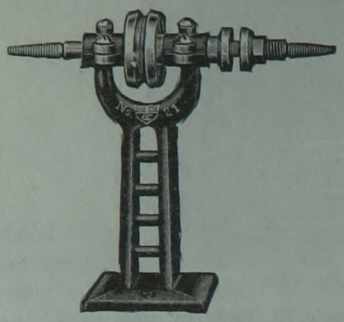


Fig 1171

Steel spindle; carefully threaded taper screws on each end; one end is provided with flanges for holding a wheel ¾ inch thick; screws and caps of brass; pulley will take ¼-inch round or ¾-inch flat belt.

Each

NO. 21—Spindle, ¾ Inch in Diameter and 8 Inches Long; Diameter of Pulley, 1⅞ Inches; Height, 7 Inches; Weight Each, 2¼ Lbs..... $2.20

No. 23

Similar in appearance to No. 21 head but with three jaw chuck on one end of spindle; flanges hold wheel ¾ inch thick; pulley will take ¼-inch round or ¾ inch wide, flat belt.

Each

NO. 23—¾-Inch Spindle, 8 Inches long; Diameter of pulley, 1⅞ Inches; Capacity of chuck 0 to 5/32 Inch; Height,7 inches; Weight Each, 2¾ Lbs..... $2.80

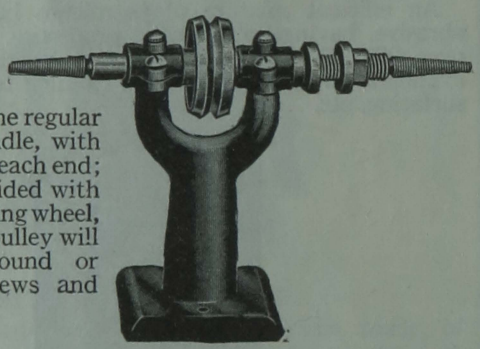


Fig. 1172

Slightly larger and stronger than the regular type; steel spindle, with taper screw on each end; one end is provided with flanges for holding wheel, ¾ inch thick; pulley will take either round or flat belt; screws and caps of brass.

Each

NO. 22—½-Inch Spindle, 10 Inches Long; Diameter of Pulley, 2¼ Inches; Height, 7 Inches; Weight Each, 4 Lbs..... $3.20

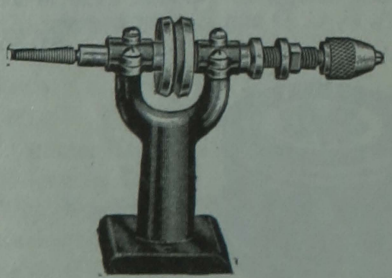


Fig. 1173

Steel spindle, with taper screw on one end and three jawed chuck on the other; flanges for holding a wheel ¾ inch thick; pulley will take either round or flat belt.

Each

NO. 24—½-Inch Spindle, 10 Inches Long; Chuck Capacity, 0 to ¼ Inch; Diameter of Pulley, 2¼ Inches; Height, 7 Inches; Weight Each, 4¾ Lbs..... $4.40

All Above, One in a Box

GRINDING HEADS

The bases of the iron frame are hollow, making the machine very light; spindle holes are reamed and counter-bored; collars and spindles are lathe turned so that they will run accurately; pulleys are so constructed that they will take either round or flat belt; all iron parts are **enameled red and black; steel parts are polished.**

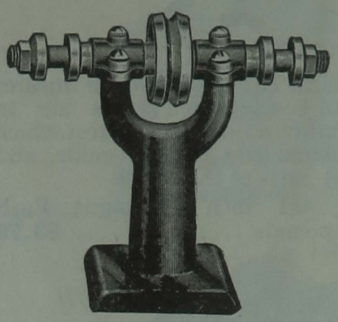


Fig. 1174

Steel spindle, with two sets of flanges for holding wheels ¾ inch thick; pulley takes either ¼-inch round or ¾-inch flat belt; screws and caps are brass.

Each

NO. 25—½-Inch Spindle; 7 Inches Long; Diameter of Pulley, 2¼ Inches; Height, 7 Inches; Weight Each, 3¾ Lbs..... $3.90

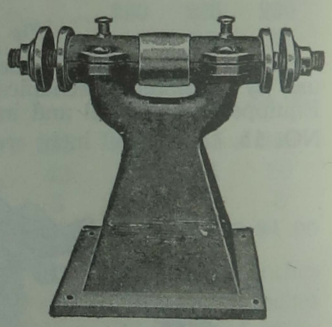


Fig. 1175

Heavier and larger than No. 25; spindle has two sets of flanges for holding wheels ¾ inch thick, with ½ inch hole any size up to 8 inches in diameter. Six-inch wheels are recommended;patented oil cups; case-hardened nuts; base is designed for great rigidity.

Each

No. 26—¾-Inch Spindle, 9 Inches Long; Diameter of Pulley, 1¾ Inches; Height, 7 Inches; Weight Each, 12½ Lbs..... $6.60

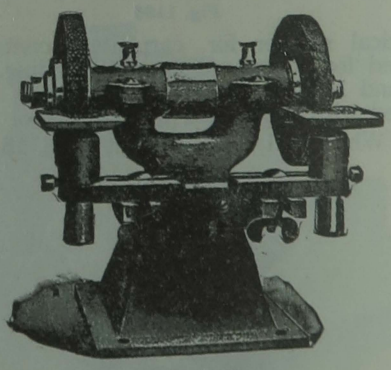


Fig. 1176

Similar to head shown above, except that it has detachable work rests which add to the usefulness of the machine; work rests can not be used with wheels larger than 6x½ inches; no emery wheels furnished.

Each

NO. 26½—Diameter of Spindle, ¾ Inch; Length, 9 Inches; Diameter of Pulley, 1¾ Inches; Height, 7 Inches; Weight Each, 14½ Lbs..... $9.00

All Above, One in a Box

WIRE WHEEL BRUSHES

ECONOMY

Fig. 1177

Wire wheel brushes are used to advantage for cleaning castings, producing finishes, etc. They are built up by sections mounted on a hub and are operated on an ordinary emery grinder. The wire used in the brushes is especially manufactured for that purpose from a special grade of steel. The brushes present a stiff, uniformly sharp, abrasive surface; will wear down evenly without wires crystallizing, bending or breaking.

Best results can be obtained when used on figured castings if run at the following speeds.

NOS.	50C	53C	54C	55C	56C	57C
Diameter Inches	15	12	10	8	7	6
R. P. M.	12-1600	15-1800	18-2100	21-2400	24-2600	26-2800

When employed on plain, smooth surfaces, they should be run at a slightly higher speed.

WIRE SECTIONS

For Economy Wire Wheel Brushes

The wire is formed into sections and to make a complete wheel it is only necessary to mount these sections to the desired width on one of the hubs.

The finished brushes have straight even faces and wear down evenly. They do not crystallize, break or bend out of shape.

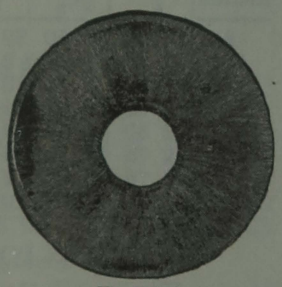


Fig. 1178

NOS.	3314	3411	358
Diameter Section, Inches	15	12	10
Sections per Set	6	5	5
Wire Number	33	34	35
For Hub, No.	50C	53C	54C
Per Set	**$8.14**	**6.12**	**4.53**

NOS.	364	373	392½
Diameter Section, Inches	8	7	6
Sections per Set	4	4	4
Wire Number	36	37	39
For Hub, No.	55C	56C	57C
Per Set	**$3.32**	**3.32**	**3.32**

WIRE WHEEL BRUSH HUBS

ECONOMY

Fig. 1179

MALLEABLE IRON HUBS ONLY

NOS.	50C	53C	54C
Diameter Hub, Inches	6¼	5	5
Shaft Bearing, Inches	2⅞	2⅜	2⅜
Width Face, Inches	2½	2	1¾
For Section Number	3314	3411	358
Diameter Section, Inches	15	12	10
Each	**$9.34**	**13.13**	**13.13**

NOS.	55C	56C	57C
Diameter of Hub, Inches	4	3	3
Shaft Bearing, Inches	2	1⅞	1⅞
Width Face, Inches	1½	1¼	1⅛
For Section Number	364	373	392½
Diameter Section, Inches	8	7	6
Each	**$9.19**	**7.09**	**7.09**

When ordering, state size of arbor hole required.

No. 50C, made for arbors 2 Inches diameter, and smaller.

Nos. 53C and 54C, for arbors 1¼ Inches diameter, and smaller.

Nos. 55C, 56C and 57C for arbors 1 Inch diameter, and smaller.

Additional charge made for larger size arbors.

WIRE WHEEL BRUSHES

MONITOR—SECTIONAL

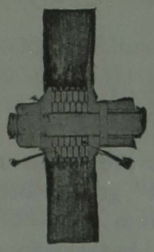


Fig. 1180

These sections are especially designed to provide a convenient and practical method of building a wheel of any width of face without the use of a hub. Each section, a complete wheel in itself, can be mounted directly on a shaft or spindle. Cross section view shows the construction and relative position of several sections when mounted between the flanges of an emery wheel grinder. The wire brush part is formed on a continuous stem, encased between two steel discs, welded together and having broad contact points so that each section will remain rigid and in its original position.

NOS.	Outside Diam. Ins.	Face Plate Diam. Ins.	Size Arbor, Ins.	Size of Wire No. of Gauge	Size of Wire Decimal Ins.	Per Hundred Sections
3356	15	6	¾ to 2½	33	.011	$177.19
3444	12	5	¾ to 1½	34	.010	160.13
3532	10	5	¾ to 1½	35	.0095	153.13
3616	8	4	½ to 1½	36	.009	134.31
3712	7	3	½ to 1	37	.0085	117.25
3910	6	3	½ to 1	39	.0075	105.88

When ordering, state size of arbor hole wanted.

When ordering brush sections, specify in addition to the gauge number, the name of the standard gauge to which the number refers, as United States Standard, English, etc. Table shows sizes in Washburn & Moen gauge.

FIBRE WHEEL BRUSHES

RIEHL—TAMPICO

Fig. 1181

With aluminum hubs and fibre sections. These wheels are made up of individual sections slipped over a two-piece adjustable and self-locking hub. The tampico fibre is built about the tough sheet steel washer in a manner that makes it possible to secure the tufted effect of a wire wheel and which provides a much fuller and more compact brushing surface than can be secured in other wheels.

HUBS ONLY

The hubs are for use with tampico sections only, and cannot be used for wire wheels. When ordering, state the size of arbor hole desired.

Fig. 1182

NOS.	Face Plate Diam., Inches	Will Hold Sections	Width Face, Inches	Diam. Sections, Inches	Hub, Each
33	3	3	1½	6, 7	$2.62
34	3	4	2	6, 7	2.71
43	4	3	1½	8	2.89
44	4	4	2	8	3.15
530	5	3	1½	8, 9, 10	3.25
540	5	4	2	8, 9, 10	3.68
550	5	5	2½	8, 9, 10	3.94
63	6	3	1½	12 up	4.64
64	6	4	2	12 up	4.99
65	6	5	2½	12 up	5.41
66	6	6	3	12 up	5.77

FIBRE SECTIONS

For Fibre Wheel Brushes

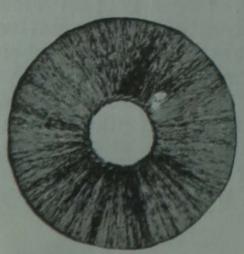


Fig. 1183

Fibre sections are made in three grades: "A" grade, fine; "B" grade, medium fine; "C" grade, coarse; and in two colors, white and gray. When ordering, specify brush number, grade, color and size of hub on which sections are to be used. "B" grade, white furnished, unless otherwise ordered.

SECTIONS ONLY

NOS.	Outside Diameter, Inches	Diameter of Hubs, Inches	Per Hundred
1510	6	3	$45.06
1511	7	3	49.87
1513	8	4	55.56
1514	8	5	68.69
1515	9	5	72.62
1516	10	5	73.94
1518	12	6	84.88
1519	14	6	97.13
1520	16	6	113.32

FELT WHEELS

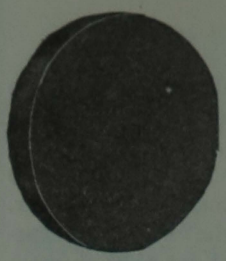


Fig. 1184

Made of good grade of felt, evenly graded, carefully balanced and seasoned. Stitched laminated felt wheels are made of sheets of felt, stitched and cemented together to the desired thickness. Useful to manufacturers of stove trimmings, brass goods, cut glass, etc. Made of all wool, and less expensive than Spanish or Mexican felts. Laminated wheels are also made solid. These wheels are sold by the pound.

Prices on Application

MUSLIN BUFFS

BLEACHED AND UNBLEACHED

When ordering buff sections, state number of plys per section and whether one row of stitching, or radially stitched from center to periphery. Pieced and radially sewed buffs are sold according to weight per section. Mention weight and size of bore on inquiries or orders.

Fig. 1185

MUSLIN CLOTH POLISHING WHEELS

Made of sections of unbleached muslin, yellow cloth, or drills, and cemented together to desired thickness.

Price Each

Dia., Inches	Thickness, Inches						
	1	1½	2	2½	3	3½	4
8	$1.00	$1.50	$2.00	$2.40	$2.80	$3.20	$3.50
10	1.10	1.60	2.10	2.50	3.10	3.60	4.00
12	1.50	2.25	3.00	3.60	4.50	5.00	5.50
14	2.00	3.00	3.90	4.80	5.70	6.50	7.25
15	2.30	3.40	4.50	5.60	6.60	7.50	8.40
16	2.75	4.10	5.40	6.70	8.00	9.25	10.25
18	3.75	5.60	7.40	9.20	11.00	12.50	14.00
20	5.00	7.50	10.00	12.50	14.50	16.50	18.50

CANVAS POLISHING WHEELS

Fig. 1186

Furnished with iron bushings, flanges, or steel plates; loose, with one row of stitches at arbor or stitched from arbor to periphery with rows ⅜, ¾, or 1 inch apart; solid, cemented and glued; or soft, partly stitched and cemented. Made of light duck, canvas, and canvas belting.

Price Each

Dia., Inches	Thickness, Inches						
	1	1½	2	2½	3	3½	4
6	$1.00	$1.25	$1.50	$1.75	.....	.....	.....
8	1.75	2.25	2.75	3.25	$3.75	.....	.....
10	2.25	2.75	3.25	3.75	4.50	.....	.....
12	2.50	3.50	4.50	5.50	6.50	$7.50	$8.50
14	3.50	4.75	6.25	7.00	8.25	9.50	10.00
16	4.50	5.75	7.50	8.50	10.50	12.50	14.50
18	5.50	7.00	9.50	11.25	13.00	15.00	18.00
20	6.75	8.50	11.75	14.00	17.00	20.00	24.00

EMERY CLOTH

Fig. 1187

A good all-around abrasive for finishing and polishing all metals. Made of highest grade material.

In Sheets 9 x 11 Inches

NOS.	Per Ream	NOS.	Per Ream
000 to 100	$30.00	2½	$39.40
½	31.20	3	42.50
1	32.75	3½	46.00
1½	34.30	Assorted	33.25
2	36.50		

Crocus Cloth—Per Ream (2 Rms. in Bdle.).....$30.00

Packed in Bundles for shipment as follows:

NOS.	000	00	0	100	½	1	1½	2	2½	3	3½	Ass'd
Grains	F	150	120	100	90	80	70	60	46	36	24	...
Reams	2½	2½	2½	2	2	1¾	1½	1¼	1	¾	¾	2

480 Sheets to Ream, in Quires. Smallest Package ¼ Ream
In Extra Coated Rolls. Per Roll of 50 Yards

Width, Inches	000 to 100	½	1	1½	2	2½	3	3½
3	$4.10	$4.30	$4.55	$4.90	$5.10	$5.50	$6.00	$6.50
3½	4.75	4.95	5.25	5.65	6.00	6.50	7.00	7.60
4	5.35	5.65	6.00	6.40	6.80	7.35	7.95	8.60
5	6.65	7.00	7.40	7.95	8.45	9.15	9.85	10.70
6	7.90	8.30	8.85	9.45	10.10	10.90	11.75	12.75
7	9.15	9.65	10.25	11.00	11.70	12.65	13.65	14.85
8	10.40	10.90	11.65	12.50	13.35	14.40	15.60	16.90
9	11.65	12.25	13.05	14.00	14.95	16.15	17.50	18.95
10	12.95	13.60	14.50	15.55	16.60	17.95	19.40	21.05
12	15.45	16.20	17.30	18.60	19.85	21.45	23.20	25.20
14	18.00	18.90	20.20	21.65	23.10	25.00	27.05	29.35
15	19.25	20.30	21.60	23.20	24.75	26.75	28.90	31.40
16	20.55	21.60	23.00	24.70	26.40	28.50	30.85	33.50
18	23.05	24.25	25.85	27.75	29.65	32.05	34.65	37.60
20	25.60	26.90	28.70	30.80	32.90	35.60	38.50	41.80
24	30.60	32.20	34.35	36.90	39.40	42.60	46.15	50.05
27	32.15	33.85	36.10	38.80	41.50	44.90	48.60	52.80

EMERY PAPER

In Sheets 9 x 11 Inches

NOS.	Per Ream	NOS.	Per Ream	NOS.	Per Ream
000-0	$10.00	1½	$13.60	3	$20.50
½	10.80	2	15.70	3½	23.60
1	11.90	2½	18.00	Assorted	11.25

Packed in Bundles for shipment as follows:

NOS.	000	00	0	½	1	1½	2	2½	3	3½	Ass'd
Grains	F	150	120	90	80	70	60	46	36	24	...
Reams	4½	4½	4	3½	3	2½	2	1½	1½	1½	2½

480 Sheets to Ream. Smallest Package ½ Ream
In Extra Coated Rolls. Per Roll of 50 Yards

Width, Inches	000 to 0	½	1	1½	2	2½	3	3½
2	$1.30	$1.35	$1.40	$1.50	$1.65	$1.85	$2.05	$2.30
3	1.75	1.85	1.95	2.15	2.35	2.65	2.95	3.30
3½	2.00	2.10	2.25	2.45	2.65	3.05	3.40	3.80
4	2.25	2.35	2.55	2.75	3.00	3.40	3.85	4.30
6	3.20	3.40	3.65	3.95	4.35	4.95	5.60	6.30
8	4.20	4.45	4.75	5.20	5.70	6.55	7.40	8.30
9	4.70	4.95	5.30	5.80	6.40	7.30	8.25	9.30
10	5.15	5.50	5.90	6.40	7.05	8.10	9.15	10.30
12	6.15	6.50	7.00	7.65	8.45	9.65	10.90	12.30
15	7.60	8.05	8.65	9.45	10.45	11.95	13.55	15.30
16	8.10	8.60	9.20	10.05	11.10	12.75	14.45	16.30
18	9.05	9.60	10.30	11.25	12.45	14.30	16.20	18.30
20	10.05	10.60	11.45	12.50	13.80	15.85	17.95	20.30
24	11.00	11.70	12.60	13.80	15.30	17.60	20.00	22.60

Intermediate sizes at next higher list

FLINT PAPER

Fig. 1188

In Sheets 9 x 11 Inches

NOS.	Per Ream	NOS.	Per Ream
000 to 0	$5.00	2½	$9.30
½	5.30	3	10.60
1	6.00	3½	11.90
1½	7.00	4	13.60
2	8.10	Assorted	7.00

Packed in Bundles for shipment as follows:

NOS.	000	00	0	½	1	1½	2	2½	3	3½	4	Ass'd
Reams	5	5	5	4	3½	3	2½	2	1½	1½	1	2½

480 Sheets to Ream. Smallest Package ½ Ream
Extra Coated in Rolls. Per Roll of 50 Yards

Width, Inches	000 to 0	½	1	1½	2	2½	3	3½
2½	$1.25	$1.30	$1.45	$1.55	$1.70	$1.85	$2.00	$2.15
3	1.45	1.50	1.65	1.85	2.00	2.15	2.35	2.50
4	1.80	1.90	2.10	2.35	2.55	2.80	3.00	3.25
6	2.60	2.70	3.05	3.35	3.70	4.00	4.35	4.75
8	3.35	3.50	3.95	4.35	4.85	5.25	5.70	6.20
9	3.70	3.90	4.40	4.90	5.40	5.85	6.40	6.95
10	4.10	4.35	4.85	5.40	5.95	6.50	7.05	7.70
12	4.85	5.15	5.75	6.90	7.10	7.75	8.40	9.15
15	6.00	6.35	7.15	7.95	8.80	9.60	10.45	11.35
18	7.15	7.55	8.50	9.45	10.45	11.40	12.45	13.55
20	7.90	8.35	9.40	10.45	11.60	12.65	13.80	15.05
24	8.60	9.10	10.30	11.50	12.80	14.00	15.30	16.70
30	10.75	11.35	12.85	14.35	16.00	17.50	19.10	20.85
36	12.90	13.65	15.45	17.25	19.20	21.00	22.95	25.05
40	14.30	15.15	17.15	19.15	21.35	23.35	25.50	27.85
42	15.05	15.90	18.00	20.10	22.40	24.50	26.75	29.20
48	17.20	18.20	20.60	23.00	25.60	28.00	30.60	33.40

GARNET PAPER

In Sheets 9 x 11 Inches

NOS.	Per Ream	NOS.	Per Ream	NOS.	Per Ream
000-0	$11.00	1½	$17.50	2½	$23.60
½	12.70	2	20.40	3	26.30
1	15.00				

Packed in Bundles for shipment as follows:

NOS.	000	00	0	½	1	1½	2	2½	3
Reams	4½	4	3½	3	2	2	1½	1	1

480 Sheets to Ream. Smallest Package ½ Ream.
Extra Coated in Rolls. Per Roll of 50 Yards

Width, Inches	000 to 0	½	1	1½	2	2½	3
2½	$1.75	$1.90	$2.15	$2.35	$2.65	$2.90	$3.25
3	2.05	2.25	2.50	2.80	3.10	3.45	3.80
4	2.60	2.90	3.20	3.60	4.05	4.50	5.00
5	3.20	3.55	3.95	4.45	4.95	5.55	6.15
6	3.75	4.20	4.70	5.25	5.90	6.60	7.35
8	4.90	5.50	6.15	6.90	7.75	8.70	9.65
9	5.50	6.10	6.85	7.75	8.70	9.75	10.80
10	6.05	6.75	7.60	8.60	9.55	10.75	12.00
12	7.20	8.05	9.05	10.25	11.50	12.85	14.35
15	8.95	10.00	11.25	12.70	14.30	16.05	17.90
18	10.65	11.90	13.40	15.20	17.10	19.15	21.40
20	11.80	13.20	14.90	16.80	18.95	21.25	23.75
24	13.00	14.60	16.50	18.70	21.10	23.70	26.50
30	16.25	18.25	20.60	23.35	26.35	29.65	33.15
36	19.50	21.90	24.75	28.10	31.70	35.60	39.80
40	21 65	24.30	27.50	31.20	35.20	39.55	44.20
42	22.75	25.55	28.85	32.70	36.95	41.50	46.40
48	26.00	29.20	33.00	37.40	42.20	47.40	53.00

Intermediate sizes at next higher list

SQUARING SHEARS

Are Rigid, Easy of Operation and Durable

Bed is bolted to the housings and it can be shifted on its seats towards or away from the upper knife.

Hold-down works automatically. It exerts pressure upon the sheet while being cut and raises quickly when the cut is made. Several openings in the hold-down enable the operator to see the cutting line.

Knives are made of high grade steel welded to iron, the steel being properly hardened. The knives are ground true and fit without lining.

The Shears are furnished with a set of front, back, bevel and side gauges. The back gauge, which is carried on brackets fastened to the cutter bar, can be set close up to the lower knife so that narrow strips can be gauged.

A brake is used in connection with the driving mechanism, to insure stoppage of the gate at the highest point.

Gibs are provided for taking up wear of cutting bar. Gates or crossheads to which the upper knife is attached are proportioned to eliminate any tendency to spring when cutting within the rated capacity. Equipped with automatic clutch. A slight depression of the Treadle will trip the clutch without any stoppage of the fly-wheel. One pair long front arms hold-down attachment and complete gauge equipment furnished with each machine.

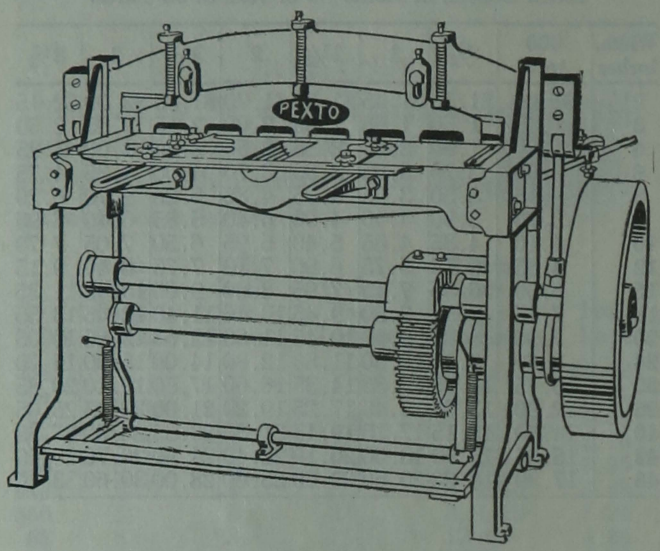


Fig. 1189

POWER—GEARED

Nos. 224B and 225B have center legs and two balance wheels.

Capacity—No. 14 Gauge Iron and Lighter

NOS	220B	221B	222B
Length, Cutting Blades, Inches	32	36	42
Fly Wheel, Inches	24x4½	24x4½	24x4½
Weight, Fly-wheel, Lbs	225	225	225
Speed, Fly-wheel, R. P. M	200	200	200
Ratio of Gearing	4:1	4:1	4:1
Length, Long Front Arms, Inches	25¼	25¼	25¼
Length, Rear Gauge Arms, Inches	30	30	30
Width, Bed Plate, Inches	12½	12½	12½
Weight, Each Lbs	1310	1425	1535
Each $	.....	.....	.....

NOS	223B	224B	225B
Length, Cutting Blades, Inches	52	62	72
Fly-wheel, Inches	24x4½	24x4½	24x4½
Weight, Fly-wheel, Lbs	225	225	225
Speed, Fly-wheel, R. P. M	200	200	200
Ratio of Gearing	4:1	4:1	4:1
Length, Long Front Arms, Inches	25¼	25¼	25¼
Length, Rear Gauge Arms, Inches	30	30	30
Width, Bed Plate, Inches	12½	12½	12½
Weight, Each Lbs	1815	2250	2600
Each $	.....	.....	.....

Regularly Shipped on Skids
Extra Charge for Boxing or Crating
Prices on Application

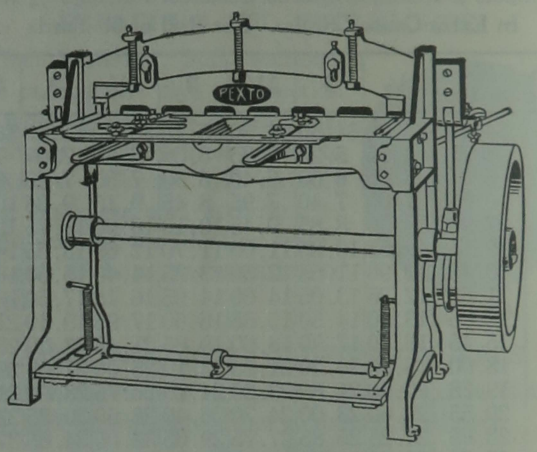


Fig. 1190

POWER—WITHOUT GEARING

No. 215B is fitted with center leg.

Capacity—No. 18 Iron Gauge and Lighter.

NOS	210B	211B	212B
Length, Cutting Blades, Inches	30	36	24
Fly-wheel, Inches	24x4½	24x4½	24x4½
Weight, Fly-wheel, Inches	225	225	225
Speed, Fly-wheel, R. P. M	75	75	75
Length, Short Front Arms, Inches	12½	12½	12½
Length, Long Front Arms, Inches	25¼	25¼	25¼
Length, Rear Gauge Arms, Inches	30	30	30
Width, Bed Plate, Inches	12½	12½	12½
Weight Each Lbs	1185	1300	1400
Each $	.....	.....	.....

NOS	213B	214B	215B
Length, Cutting Blades, Inches	52	62	72
Fly-wheel, Inches	24x4½	24x4½	24x4½
Weight, Fly-wheel, Inches	225	225	225
Speed, Fly-wheel, R. P. M	75	75	75
Length, Short Front Arms, Inches	12½	12½	12½
Length, Long Front Arms, Inches	25¼	25¼	25¼
Length, Rear Gauge Arms, Inches	30	30	30
Width, Bed Plate, Inches	12½	12½	12½
Weight Each, Lbs	1680	1740	2100
Each $	.....	.....	.....

Regularly Shipped on Skids
Extra Charge for Boxing or Crating
Prices on Application

SQUARING SHEARS

WITH GAP

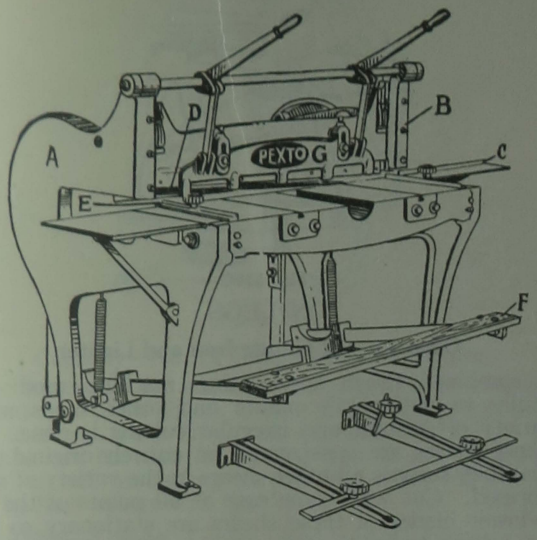


Fig. 1191

FOOT POWER

Capacity—No. 16 Gauge and Lighter

Stiffness, rigidity and ease of operation are attained by the design and construction of these shears. Continuous cutting. Knives are of the highest grade hardened steel, scientifically welded to iron back; gibs are provided for taking up wear of cutting bars; gates or cross heads to which upper knife is attached are proportioned to eliminate any tendency to spring when cutting within the rated capacity; arched automatic hold-down attachment makes visible a line drawn on the metal for accurate cutting; the hold-down attachment is operated by hand and slides on independent ways so that when the blades are in motion they hold down metal by means of the levers. Housings (A) and (B) have a gap of 18 inches for permitting the cutting of sheets from ½ inch to the full depth of the gap in housings. The slitting gauge (C) facilitates the slitting of sheets of longer length than the cutting blades (D) and (E). The first cut made, the slitting gauge (C) secures proper alignment of the successive cuts. The treadle (F) is steel and extensible. The lever hold-down (G) presses the sheet with security for insuring an accurate and clean cut. Used as a regular squaring shears, they will cross-cut sheets at any point desired and of full width, according to the length of shears used.

Capacity given applies to soft steel and iron. In steel running higher in carbon, the hardness must be taken into consideration.

NOS	XC36	XC42	XC52
Length Cutting Blades, Inches	36	42	52
Depth of Throat, Inches	18	18	18
Length Front Arms, Inches	26½	26½	26½
Length Rear Gauge Arms, Inches	24	24	24
Width of Bed Plate, Inches	14	14	14
Weight Each, Lbs	1,600	1,700	1,900
Each	$		

Regularly Crated—Extra Charge for Boxing

Prices on Application

SQUARING SHEARS

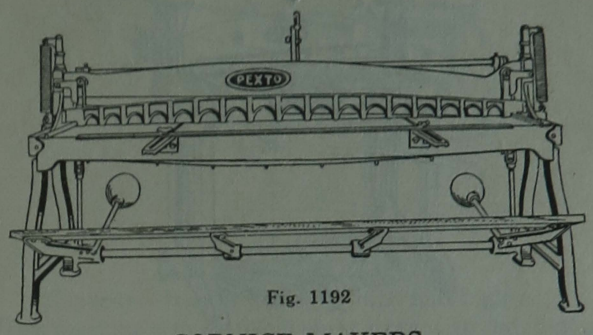


Fig. 1192

CORNICE MAKERS

Capacity—No. 18 Gauge Iron and Lighter

Practical machine for cornice makers and others. These shears are fitted with automatic back gauge operated from the front of the machine through a hand lever and position of back gauge is indicated on a graduated steel scale attached to the top of right-hand back arm; same can be plainly seen at any point from front of machine; gauge moves parallel to the cutting blades. In operating lever from the front a slide indicator follows the graduation on the work and strips ¾ to 11 inches can be cut; to cut from 11 to 20 inches in width move gauge to the second pocket in the slides. Fitted with weight-balanced foot treadle insuring ease of operation.

NOS	190	191
Size, Inches	72	96
Weight Each, Lbs	2,100	2900
Each	$....	....

Regularly Crated—Extra Charge for Boxing

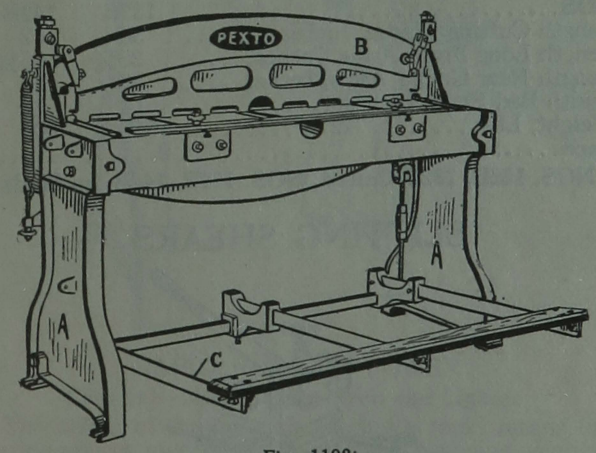


Fig. 1193

Capacity—No. 16 Gauge and Lighter

For cutting sheet metals; can also be used for cutting leather, cloth, paper, hard or soft rubber, etc.

No. 16 Gauge is as heavy as should be cut with a foot power squaring shears. Iron of heavier gauges should be cut with a squaring shears arranged for power drive. These heavy patterns can be depended upon to cut with a nicety up to their full rated capacity. Solid Cast Iron legs (A) a well proportioned gate (B) that holds the upper cutting blade, and a steel extension treadle (C) are features which make them desirable for the shop where a heavy foot power squaring shears in used.

NOS	O230B	O236B	O240B
Length Cutting Blades, Inches	31½	37	42
Length Long Front Arms, Inches	25¼	25¼	25¼
Length Rear Gauge Arms, Inches	30	30	30
Width of Bed Plate	12½	12½	12½
Shipping Weight, Approx. Lbs.	790	920	960
Each	$...	...	...

Prices on Application

SQUARING SHEARS

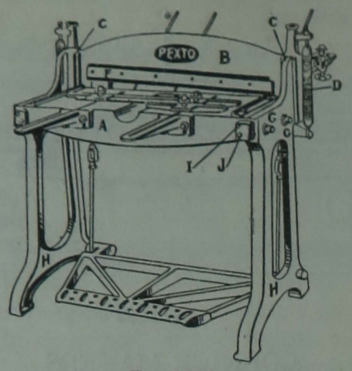


Fig. 1194

FOOT POWER

Capacity—No. 18 Gauge Iron and Lighter

Has extra wide bed plate and will cut up to full rated capacity much easier than any other similar shears of same capacity.

Nos. 137B and 142B are furnished regularly with hold down attachments. No. 122B is supplied with short front arm, others with long front arms.

Finger guage is furnished with Nos. 122B and 132B and complete guage equipment is furnished with all numbers.

NOS.	122B	132B
Length Cutting Blades, Inches	22	30
Length Long Front Arms, Inches	00	19
Length Rear Gauge Arms, Inches	24	30
Width Bed Plate, Inches	12	14
Weight, Each, Lbs.	375	540
Each	$.....	.....

NOS.	137B	142B
Length Cutting Blades, Inches	36	42
Length Long Front Arms, Inches	25¼	25¼
Length Rear Gauge Arms, Inches	30	30
Width Bed Plate, Inches	14	14
Weight, Lbs.	650	800
Each	$.....	.....

NOS. 122B, 132B Crated; NOS. 137B, 142B, on Skids

SLITTING SHEARS

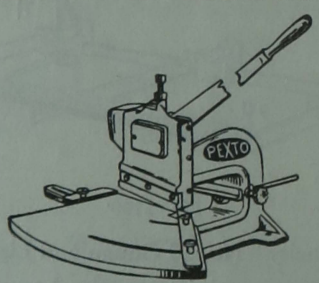


Fig. 1195

Capacity—NO. 248, 18 Gauge Iron and Lighter
Capacity—NO. 248, 16 Gauge Iron and Lighter

These Shears are constructed on entirely original principles. A splendid, practical shears for range manufacturers and for general use in car shops, automobile plants and other shops where a variety of straight and irregular cutting is being done. Blades are so constructed that lines drawn on the work are always exposed to view of the operator.

NOS	248A	249A
Length Cutting Blades, Inches	6½	9
Depth Cutting Head to Gauge, Inches	9½	15
Depth Cutting Head to Frame, Inches	10	16
Size of Table, Inches	12x15½	17x18
Weight Each, Lbs.	165	490
Each		

Prices on Application

SLITTING SHEARS

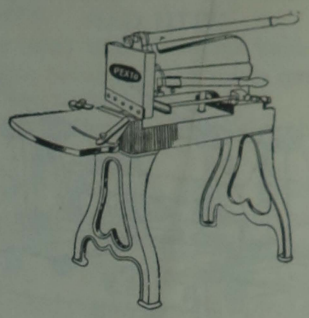


Fig. 1196

ON LEGS

Capacity—12 Gauge Iron and Lighter

A combined bench and sitting machine used successfully in automobile plants and other shops where a variety of straight and irregular cutting is done.

These shears are constructed on entirely original principles; they surpass all other shears in the variety of work performed. Cut with same ease at all points of the cut. The lower blades of these shears are stationary so that when cutting to line the mark may easily be followed with accuracy. The lift of the upper blade is adjusted to any desired height by screw when adjusted so as to permit the sheet to be passed through under the blades, the rear gauge may be so set as to cut slits or squares, octagonal, hexagonal or any other shaped hole with straight sides in the center of a sheet of metal 20 inches square or less; blades can be easily removed and ground.

NO.	241
Length Cutting Blades, Inches	9
Depth Cutting Head with Stay Bolt in place, Inches	.16
Depth Cutting Head without Stay Bolt, Inches	19¼
Depth Cutting Head to Gauge, Inches	15⅝
Weight Each, Lbs.	700
Each	$.....

Shipped on Skids.

SCROLL SHEARS

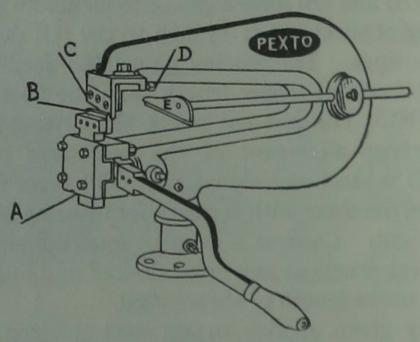


Fig. 1197

Capacity—No. 20 Gauge Iron and Lighter

Mounted on a standard which screws to the bench, and adjustable to any angle required; will cut circles, ovals, ogees and all irregular shapes; length of cut is regulated by means of a set screw in frame, under lower blade. To shorten, cut turn screw in; to lengthen, cut turn screw out. Upper blades can be adjusted for wear.

NOS.	268A	269A
Length of Cutting Blade, Inches	4	4¼
Depth of Cutting Head to Gauge, Inches.	10¾	17
Depth of Cutting Head to Frame, Inches.	12	18¼
Weight Each, Lbs.	90	133
Each	$.....	.....

Prices on Application

LEVER SHEARS

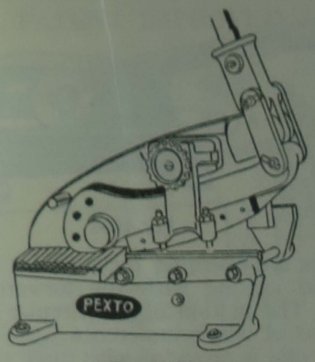


Fig. 1198

Capacity—No. 10 Gauge Iron and Lighter

Recommended for slitting sheets, length or crosswise. Patterned to allow sheets to pass freely and proportioned so as to obtain the greatest strength and durability. This machine can be used for slitting iron in any length or width as well as cutting narrow iron bars; will cut iron bars 5/16 Inch square and 1/4x1 1/2 inches.

Each

NO. O296—Length Gauge Rod, 14 1/2 Inches; Length Cutting Blade, 10 Inches; Weight Each, About 185 Lbs.....$.....

One in a Box

Note.—Blades for cutting corrugated iron can be attached at an extra cost, according to the pitch of corrugation. Can also be furnished with rod cutting attachment.

ROTARY SLITTING SHEARS

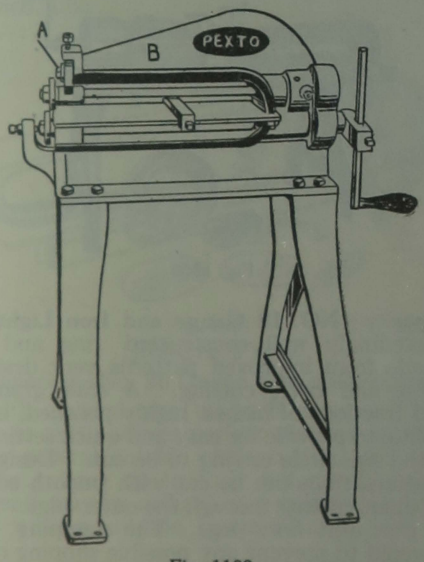


Fig. 1199

Capacity—No. 16 Gauge Iron and Lighter

For rapidly slitting iron used in cornice, furnace, blowpipe, ventilation work, etc., and for cutting large irregular curves and circles when following a scribed line; the cutters have two cutting edges, making them reversible, and the crank is adjustable to different leverages; bed plate machined; upper shear plate adjustable; cut steel gears protected in dust and oil proof case; shafts milled cold rolled steel.

Each

NO. 255A—Depth of Throat, 18 Inches; Size Table, 20x8 Inches; Weight Each, 325 Lbs.....$.....

Regularly Crated **Extra Charge for Boxing**

Prices on Application

SLITTING SHEARS

Fig. 1200

ECCENTRIC LEVER

Capacity—Iron or Steel 3/32 inch and Lighter

This machine is made to cut sheet stock with the greatest of ease. Its eccentric cutting device requires very little effort to cut sheet metal up to the full rated capacity.

It will prove a handy machine for the shop and on account of its light weight is easily carried to the job to be done outside. Has heavy cast iron frame and operating lever.

Each

NO. 253—Length Blades, 3 1/2 Inches; Length Bed, 10 1/2 Inches; Height of Bed, 6 1/2 Inches; Length Over All, including Lever, 18 Inches; Weight Each, 17 Lbs.....$...

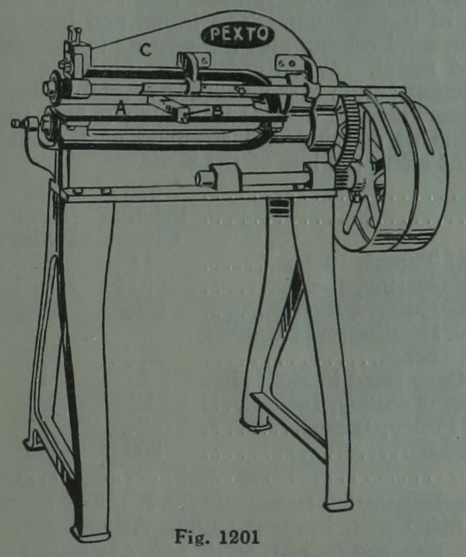


Fig. 1201

RAPID ROTARY—POWER

Capacity—No. 16 Gauge Iron and Lighter

The design of these shears permits a rapid means for slitting up iron used in cornice, furnace, blowpipe, ventilation work, etc., and may be utilized for irregular cutting on a scribed line.

A wide table with graduations is provided to support the work and fitted with an adjustable gauge. The frame is mounted on heavy cast iron legs. Gearing is machine cut; cutters are forged from a high-grade steel with two cutting edges and are reversible. Furnished with tight and loose pulleys and belt shift but friction clutch attachment can be fitted when specified. This attachment is operated with a foot treadle for instantaneous starting and stopping of the machine.

NO	260A
Diameter of Cutters, Inches	3 1/16
Depth of Cutting Head, Inches	19
Depth of Cutting Head to Gauge, Inches	18
Ratio of Gearing	4 to 1
Size of Pulleys, Inches	14x3
Speed of Pulleys, R. P. M	80
Shipping Weight, Lbs.	395
Each	$.....

Regularly Shipped on Skids, Crated

Extra Charge for Boxing **Prices on Application**

ROTARY SLITTING SHEARS

These patterns represent the latest design in rotary slitting shears with a combination of features that make them practical and most desirable for beading and crimping as well as for slitting operations. The cutters are forged from a high-grade steel, properly hardened and tempered and are arranged for permitting an accurate, quick and easy setting for different gauges of stock to be cut and for taking up any wear.

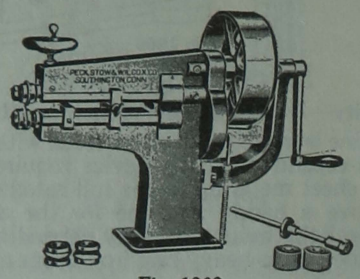


Fig. 1202

COMBINATION SLITTING, CRIMPING AND BEADING MACHINES

Capacity—NO. 16 Gauge Iron and Lighter

The design of the frame being such as to secure an extremely compact construction, they occupy a minimum amount of bench room. The frame and base are made from one solid casting and the gearing is machined from the solid metal. When ordered as illustrated equipped with friction clutch attachment, a special pulley is used. This attachment is operated through a foot treadle for instantaneous starting and stopping of the machine at any point along the line of the work.

NOS.	628	629	630
Type	Friction Clutch	Tight Pulley	Hand
Depth of Throat, Inches	11	11	11
Ratio of Gearing, Inches	3 to 1	3 to 1	3 to 1
Diameter Cutters, Inches	2 1/16	2 1/16	2 1/16
Diameter Beading and Crimping Rolls, Inches	2 3/4	2 3/4	2 3/4
Size of Ogee Bead in Rolls, Ins.	1	1	1
Diameter of Pulley, Inches	12	14	
Face of Pulley, Inches	3	3	
Weight, Lbs	260	190	175
Each	$		

Note—Illustration represents the No. 628 Combination Shears fitted with Friction Clutch Attachment.

NO. 628 Crated; NOS. 629, 630 Boxed

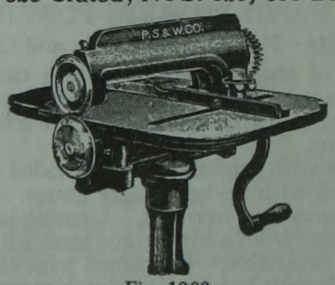


Fig. 1203

IMPROVED SLITTING SHEARS

Capacity—NO. 20 Gauge Iron and Lighter

So designed that the frame is exceedingly solid and compact, and all adjustments easily made. Has forged tool steel rotary cutters, scientifically hardened.

NO.	250A
Diameter of Cutters, Inches	3
Depth Cutting, Head to Gauge, Inches	9
Depth Cutting, Head to Frame, Inches	10 1/8
Speed of Pulley, R. P. M.	...
Narrowest Strip that can be cut, Inch	1/2
Weight Each, Lbs.	100
Each	$

Prices on Application

ROLLING CUTTER SHEARS

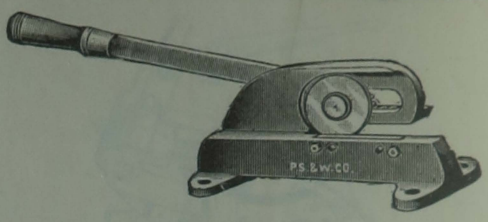


Fig. 1204

These shears are operated by a pinion lever engaging in a rack and cutting with the forward roll of the cutting disc. The motion of the circular cutting disc is about one-third of its circumference.

The cutting disc is provided with three slots, which correspond with three pins on the cutting disc bolt; this enables the operator to change the cutting disc to six different positions; three on each side—the disc being reversible.

The lower cutter blade has two cutting edges. The ends of the cutter are beveled to match the heads of the bolts which draw the cutter blade in recess of shear stock. Two set screws which press this cutter blade in opposite directions are the means to adjust the lower cutter perfectly to the upper cutter disc.

NOS.	294	295
Capacity Gauge Iron and Lighter, Nos.	20	16
Diameter Upper Cutter, Inches	1 3/4	2 3/4
Length Lower Blade, Inches	2 1/4	3 3/8
Length Bed, Inches	7	11
Height Bed, Inches	4	6
Length Over All, including Lever, Inches.	12	20
Weight Each, Lbs.	4	11
Each	$	

CIRCULAR SHEARS

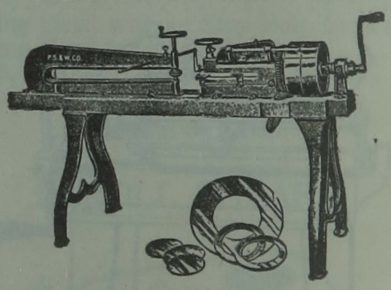


Fig. 1205

Capacity—NO. 18 Gauge and Iron Lighter

An exceedingly well constructed ring and circular shears made from improved patterns very desirable for general ring and circle cutting. A scale graduated in inches and fractions of inches, highly polished, is fixed to the bed plate to provide for easy and quick setting of tail piece for the size circle or ring to be cut. Designed with angular cutters, rings can be cut with smooth edges from a circle without cutting through the outer edge. Mounted on heavy cast iron floor legs. The clamping discs are rubber covered to prevent any possible slipping of blanks.

NO.	297
Diameter Cutters, Inches	1 5/8
Diameter Clamping Discs, Inches	2 3/4
Depth Cutting Head to Gauge, Inches	12 1/4
Depth Cutting Head to Frame, Inches	12 7/8
Depth Circle Arm, Inches	30
Size Pulleys, Inches	10x5
Speed Pulleys, R. P. M.	60
Will Circle from Square Blanks, Inches	4 to 42
Will Cut Rings Small (Inside Diameter), Inches.	4
Will Cut Rings Large (Outside Diameter), Inches.	42
Weight Each, Lbs.	600
Each	$

Regularly Shipped on Skids

Prices on Application

CIRCULAR SHEARS

PATENT IMPROVED

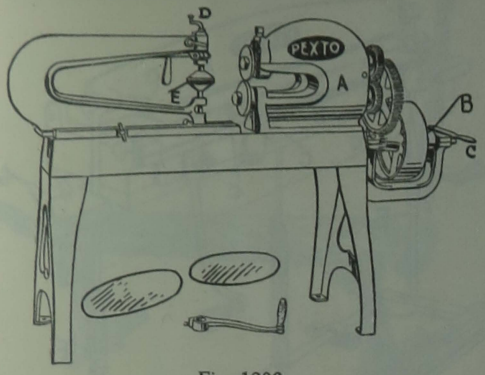


Fig. 1206

Capacity—No. 14 Gauge Iron and Lighter

Made from heavy patterns proportioned throughout for maximum strength and are intended for cutting outside circles from heavy iron. The cutting head may be utilized as a straight slitting shears, a suitable gauge being fitted to the cutting head for this purpose. A positive clutch controlled through a hand lever for instantaneous starting and stopping of the cutters is provided. The machine is mounted on heavy cast iron legs.

NO.	289
Cutters, Inches	5
Diameter Clamping Discs, Inches	4
Depth Cutting Head to Gauge, Inches	9
Depth Cutting Head to Frame, Inches	9½
Depth Circle Arm, Inches	35
Size Pulley, Inches	12x4
Speed Pulley, R. P. M.	200
Ratio Gearing	4:1
Will Circle from Square Blanks, Inches	5 to 50
Weight Each, Lbs.	700
Each	$....

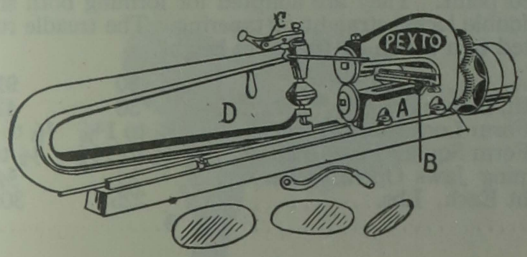


Fig. 1207

BENCH TYPE

Capacity—No. 20 Gauge Iron and Lighter

Built with unusual care, all parts accurately fitted and machined so as to secure perfect wearing qualities. Intended for general outside circle cutting and are recommended for cutting up to their full rated capacity. The cutting head may be utilized as a straight slitting shears for which work a suitable gauge is fitted to the cutting head.

Furnished with T. and L. pulleys and crank regularly. Can be furnished without pulleys fitted with crank for hand power.

NO.	283
Diameter Cutters, Inches	4
Diameter Clamping Discs, Inches	3
Depth Cutting Head to Gauge, Inches	9
Depth Cutting Head to Frame, Inches	9¾
Depth Circle Arm, Inches	28
Size Pulley, Inches	12x2
Speed of Pulleys, R. P. M.	100
Will Circle from Square Blanks, Inches	4 to 40
Weight Each, Lbs.	300
Each	$....

One in a Box.
Prices on Application.

CIRCULAR SHEARS

PATENT IMPROVED

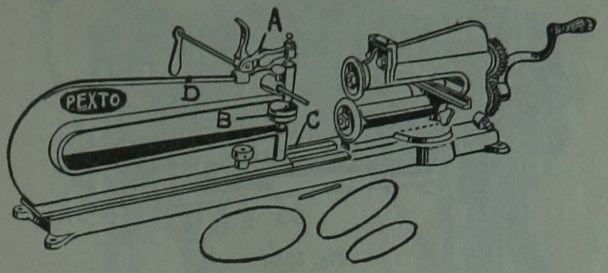


Fig. 1208

NO. 278—Capacity—22 Gauge Iron and Lighter

Most suitable for cutting outside circles, trimming or squaring tinplate, sheet iron, brass and copper; a polished graduated scale is attached to the bed for the purpose of securing quick and accurate adjustment of the sliding arm; fitted with quick-acting eccentric lever, which clamps material between disc with great rapidity and releases the blank instantly; Rubber covered discs prevent possible slipping of blanks.

NO. 280—Capacity—18 Gauge Iron and Lighter

NOS.	278	280
Diameter Cutters, Inches	3 1/16	3½
Diameter Clamping Discs, Inches	2	2¾
Depth Cutting Head to Gauge, Ins.	9¼	9¾
Depth Cutting Head to Frame, Ins.	10¼	10½
Depth Circular Arm, Inches	16¼	22¼
Will Circle from Square Blank, Ins.	2¾ to 22	3 to 31
Weight Each, Lbs.	125	200
Each	$....	....

One in a Box.

RING AND CIRCULAR SHEARS

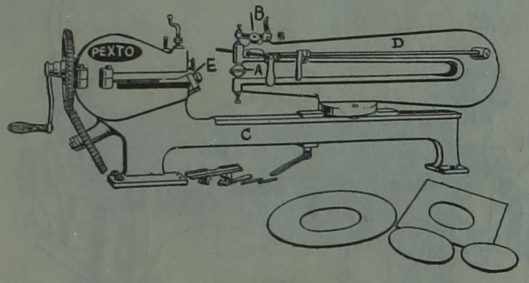


Fig. 1209

Capacity—No. 20 Gauge Iron and Lighter

For cutting circles or internal rings and irregular curves. In circular cutting the blanks are clamped between rubber covered discs by means of a quick-acting, eccentric lever device. The bed on which the tail piece slides is graduated in inches and fractions of inches for quick setting of the tail piece for the size circle to be cut.

NOS.	298	299
Diameter Cutters, Inches	1⅝	1⅝
Diameter Clamping Discs, Inches.	2¼	2¼
Depth Cutting Head Gauge, Inches	9⅛	9⅛
Depth Cutting Head Frame, Inches	10	10
Depth Circle Arm, Inches	16¼	30½
Will Circle from Square Blanks, Ins.	3¼ to 22	3¼ to 42½
Will Cut Rings Small as Inside Diameter, Inches	3¼	3¼
Will Cut Rings Large as Outside Diameter, Inches	22	42½
Weight Each, Lbs.	195	290
Each	$....	....

Regularly Crated—Boxing Extra Charge.
Prices on Application.

FOLDING MACHINES

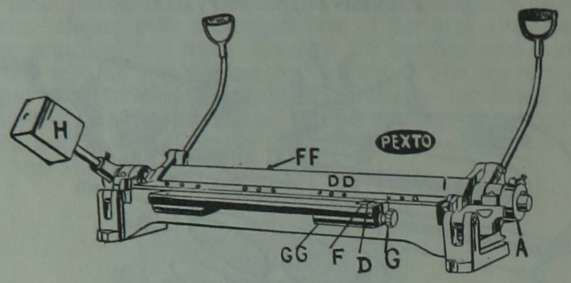


Fig. 1210

STOW'S PATENT ADJUSTABLE IMPROVED BAR FOLDERS

Capacity—5/16 Locks on No. 20 Gauge Iron and Lighter
Capacity—3/16 Locks on No. 22 Gauge Iron and Lighter

Made in extra long lengths intended for folding or edging sheets or strips of sheet iron, soft steel, brass and copper. They are adapted for forming the edges of sheet metal at various angles to form locks, square joints and to turn round edges for inserting wire. Open or round locks for wiring are made on Folders by dropping wing on the folding bar below edge of gripping jaw.

Gauge is adjustable and regulates the width of fold by turning gauge screw at right end of machine.

Adjustable stop is provided to permit the forming of any desired angle in addition to regular square and bevel stops.

NOS.	055	058
Length, Inches	37	42
Will Form Closed and Open Locks, Width, Inches	1/8 to 1	1/8 to 1 1/2
Weight Each, Lbs.	365	415
Each	$.....	.....

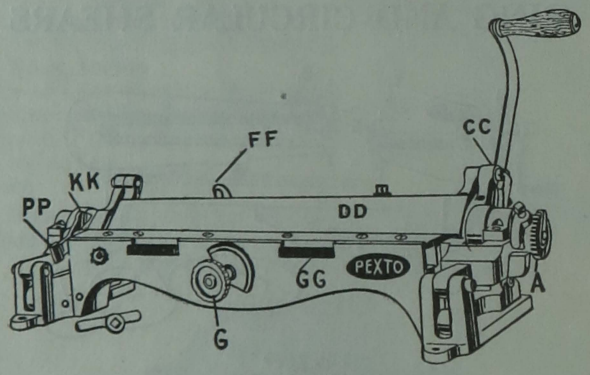


Fig. 1211

Capacity—No. 22 Gauge and Lighter

For folding the edges of sheet metal at various angles; will produce closed locks as well as open or round locks for inserting a wire in the flat sheet. Adjustable stop provided to permit the forming of any desired angle. Gripping jaw clamps material securely while bending takes place. Gauge wheel at front regulates the width of fold.

NOS.	62	63	65
Length, Inches	20 3/4	30	17
Will Form Closed and Open Locks, Inches	1/8 to 1	1/8 to 1	3/32 to 1/2
Will Form Open Locks to Receive a Wire up to Inches	1/4	1/4	3/16
Weight Each, Lbs.	182	185	60
Each	$.....	.....	.....

All Above, One in a Box
Prices on Application

FOLDING MACHINES

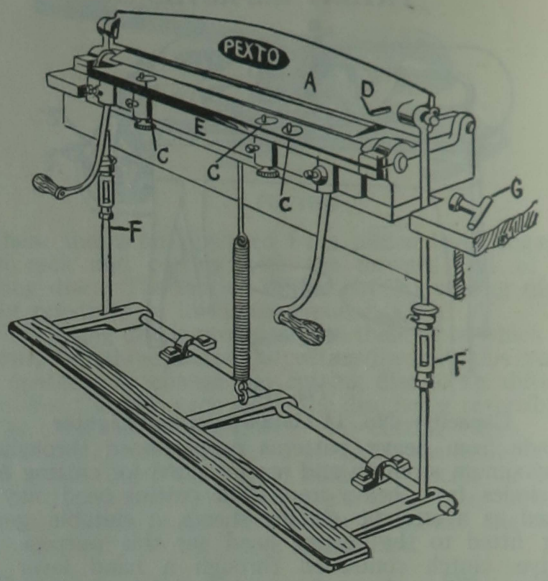


Fig. 1212

OPEN THROAT FOLDER

Capacity—No. 22 Gauge Iron and Lighter

Works upon the same principle as cornice brakes. The sheet of metal remains stationary in the machine while the lock is folded and released. Clamping bar is operated by treadle and spring. Adjustable gauges are provided. The adjustable stop pin on right end of machine can be quickly and easily adjusted for stopping the folding bar and forming angles as may be desired. The sheets can be slid through machine from front to back so that they can be folded up to any angle in excess of a right angle and at any desired point. They are adapted for forming both single and double locks, straight or tapering. The treadle rod is adapted to a bench 33 Inches in height.

NOS.	90	91
Length, Inches	30	42
Will Form Locks from Inches	3/16 to 1 3/16	3/16 to 1 5/16
Will Form Square Pipe, Inches	1/2 to 1 1/2	1/2 to 2
Clamping Jaws Open, Inches	1/2	5/8
Weight Each, Lbs.	225	300
Each	$.....	.....

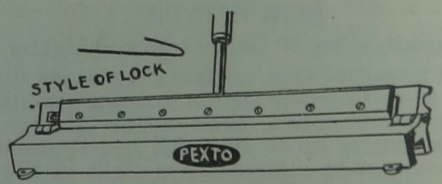


Fig. 1213

STOW'S PATTERN IMPROVED SHEET IRON FOLDERS

All iron construction with steel blades; fitted with adjustable gauge with machined steel bending blades; Japanned Finished.

NOS.	10A	15	20
Capacity, Gauge Iron	22	24	26
Length, Inches	31	42	61
Will Form Locks, Inches	1/4 to 1/2	1/4 to 1/2	1/4 to 1/2
Weight Each, Lbs.	85	107	250
Each	$.....	.....	.....

All Above, One in a Box
Prices on Application

PIPE FOLDING MACHINES

Fig. 1214

CHAMPION

Capacity—No. 22 Gauge Iron and Lighter

For folding the edges for the side seams of round pipe, after being formed as well as the edges of straight sheets.

Solid cast iron body, Japanned with solid steel gearings and tempered steel blades.

NOS	11A	13
Length, Inches	32	42
Will form locks, inches	3/16 to 7/16	1/4 to 1/2
Weight Each, Lbs	100	195
Each	$.....	.....

Note.—No. 13 Folders have a handle at each end, one of which can be removed when not used.

BRACE AND WIRE BENDERS

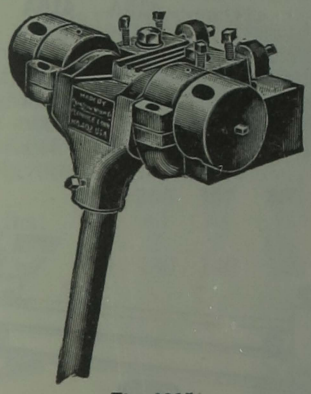


Fig. 1215

A substantial brace and wire bender intended for making braces for lookouts, gutters, leaders, cornices, etc. It will bend iron of any size up to 1/4 inch thick, 2 inches wide from 0 to 90 degrees.

The top plate is adjustable for turning sharp or round corners and for different thicknesses of metal regulated by means of the hold-down and set screws in the top plate and set screws at the back of the plate. One side of the top plate is cut with grooves in several sizes and when reversed, wires can be bent for pans, boxes, etc. Several wires can be bent at the same angle at one operation.

Handle may be used in center or at either end of machine.

NO	402
Width of Bending Plate, Inches	2
Will Form Wire, Inches, Dia	3/8
Weight Each, Lbs	60
Each	$.....

Prices on Application

CORNICE BRAKES

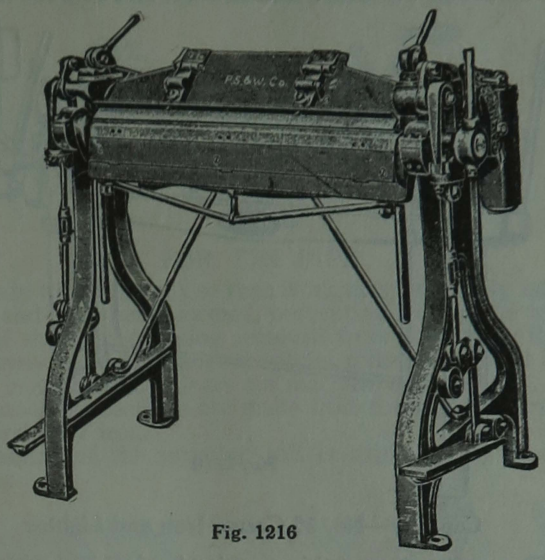


Fig. 1216

HARE'S PATTERN FOUR LEAF

Capacity—No. 20 Gauge Iron and Lighter

Has a distinctively attractive feature consisting of an attachment or fourth leaf for making circular or semi-circular forms; the parts subject to wear or strain are protected and strengthened in the most substantial manner; the journals have roller bearings, reducing the friction to a minimum; the stop bracket on right hand end of brake can be quickly and easily adjusted to bend any angle wanted. Furnished with one forcing bar and seven formers making circular and semi-circular bend, viz.: 3, 2 1/2, 2, 1 3/4, 1 1/2, 1 1/4 and 1 inch. No. 681 does not require weight on bending leaf, No. 682 has one weight on bending leaf, other numbers have two weights on bending leaf.

All iron construction; steel bending blades.

NOS	681	682	683	684	685
Length, Inches	37 1/2	42 1/2	52	74	98
Weight Each, Lbs	650	850	1070	2300	3650

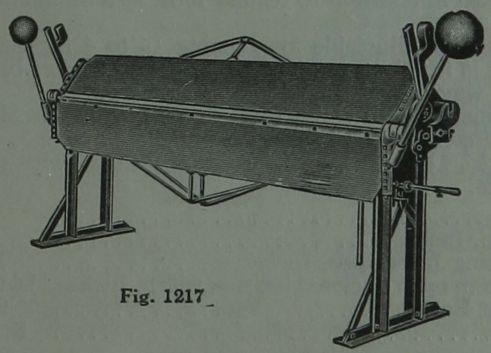


Fig. 1217

Hand levers permit the jaws to be opened at any point.

Furnished with one forcing bar and five formers for making circular and semi-circular bends. Nos. 1000, 1001, 1002, 1003 Capacity No. 18 Gauge Iron and Lighter. Nos. 1004, 1005, 1006, 1007, 1008 Capacity No. 16 Gauge Iron and Lighter. Nos. 1009, 1010, 1011, 1012 Capacity No. 14 Gauge Iron and Lighter.

Steel construction, heavy steel plates and cast hinges.

NOS	1000	1001	1002	1003
Length, Inches	61	73	97	121
Weight Each, Lbs	750	800	1000	1900
NOS	1004	1005	1006	1007
Length, Inches	46 1/2	48 1/2	73	97
Weight Each, Lbs	400	500	1200	1500
NOS	1008	1009	1010	1011	1012
Length, Inches	121	36 1/2	48 1/2	97	121
Weight Each, Lbs	2500	650	800	2000	3000

Prices on Application

BRAKE AND FOLDER MACHINES

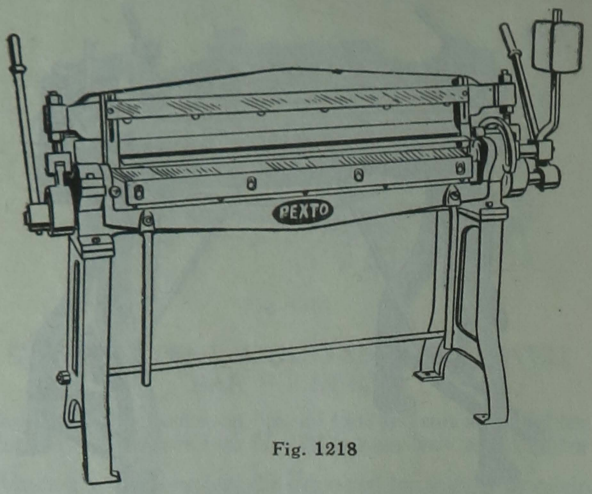


Fig. 1218

Capacity—No. 16 Gauge Iron and Lighter

The construction of this machine is of all iron with steel bending blades. The cross head is brought down and the work securely clamped through eccentrics actuated by hand levers from either end of machine. Adjustments are provided for in the eccentric connection allowing for a maximum pressure to bear on the work while in the process of forming, preventing the work slipping from a true line. This adjustment is secured through loosening top nut and tightening lower nut for heavy stock and the reverse when lighter materials are used. The bending plate is adjustable, a suitable wrench being provided for loosening the hexagon nuts when this plate may be raised or lowered for forming a closed lock or an open lock for receiving wire as large as ⅜ inch in diameter. Adjustable stop gauge is provided for the forming of angles. Form with bending blade fitted is detachable and may be quickly replaced for sectional short forms and when such forms are used the machine is highly adaptable for a wide range of pan work up to 4 inches in depth. Forming bars for producing round edges with a radius greater than 3/16 inch can be furnished in addition to regular form at a minimum extra cost.

Gauge is adjustable for gauging ⅛ to 4 inches. This Gauge is fitted on front of machine and throws back out of the way during the process of forming.

Furnished with seven formers for making circular and semi-circular bends in cornice work, etc., sizes 3, 2½, 2, 1¾, 1½, 1¼ and 1 inch. Regularly fitted with counter balance.

NO.	93
Length, Inches	42
Clamping Jaws Open, Inches	1¾
Will form open or closed locks in width, Inches.	⅛ to 1¾
Weight Each	950
Each	$.....

Regularly Crated—Extra Charge for Boxing

Prices on Application

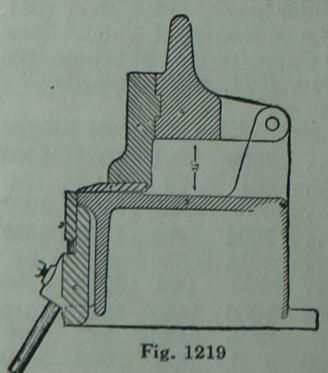


Fig. 1219

A—Folding Lever.
B—Folding Blade Adjustable for sharp locks, and round locks for wiring.
C—Folding Bar.
D—Bed.
E—Clamping Blade.
F—Blade Holder—detachable and may be replaced for short sections for pan and box work.
G—Clamping Bar.

Note opening between Bed "D" and Clamping Bar "G."

FORMING MACHINES

SLIP ROLL PATTERN—BACK GEARED

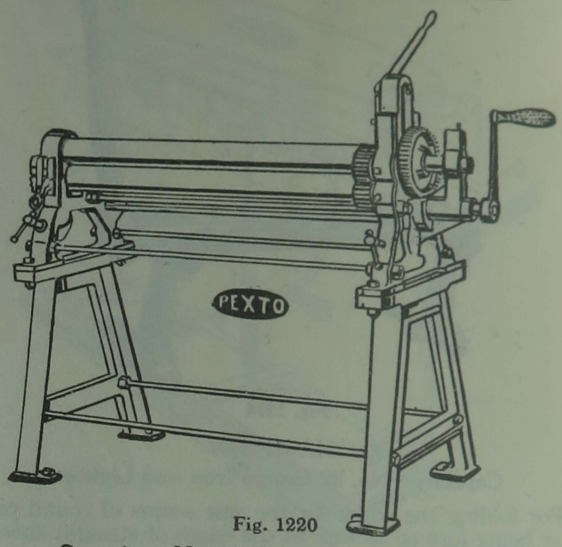


Fig. 1220

Capacity—No. 14 Gauge Iron and Lighter

Substantially constructed for heavy duty, having finely finished rolls made from a special piston rod hard steel with large driving gear cut from solid cast iron and steel machine cut connecting gears. When furnished for hand power, heavy cranks are fitted on both ends. Adjustment of clamping and rear forming roll is secured through screws, having vise handles. Grooves are cut in rolls for receiving wired sheets. Rolls are of the slip type permitting the work to be removed readily from roll after being formed.

Larger rolls will be quoted on receipt of full particulars. When ordering for power mention whether tight, or tight and loose pulleys are wanted.

NOS	415A	416A	417A	418A
Length Rolls, Inches	31½	37½	43½	49½
Diam. Rolls, Inches	3	3	3	3
Ratio of Gearing, Inches.	3 to 1	3 to 1	3 to 1	3 to 1
Size Pulley, Inches	18x4	18x4	18x4	18x4
Speed Pulley, R.P.M.	60	60	60	60
Weight Each, Lbs.	480	540	600	600
Each	$.....	.....	.....	.....

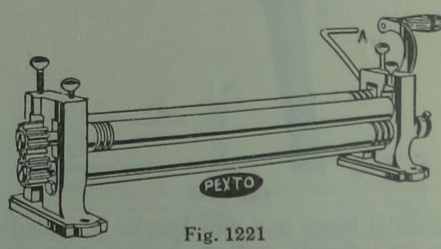


Fig. 1221

This machine is adapted for forming ovals of oblong and irregular shapes as well as for forming cylinders. Oval work is formed by means of hand lever (A). The rear or forming roll can be held in upper position while forming the end curves of ovals, and dropped to a lower position in forming the sides. They are admirably suited for forming oval boiler bodies.

Rolls are smoothly finished and made of special rolled hard steel. Grooves are cut in rolls to allow work to be formed after wiring.

NO.	401
Length Rolls, Inches	30
Diameter Rolls, Inches	
Weight Each, Lbs.	160
Each	$....

Prices on Application

FORMING MACHINES

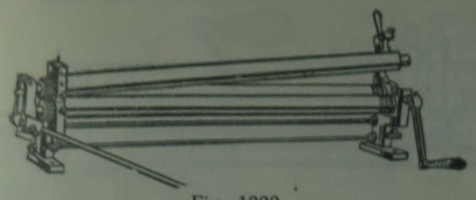


Fig. 1222

SLIP ROLL PATTERN—FOR STOVE AND TIN PIPE

All operations are performed at end where crank is located. Without changing position the sheet to be formed is placed between gripping rolls and when formed is readily taken from rolls preventing forcing the work out of shape when being removed. Rolls are finely finished, made of special rolled hard steel and adjusted by knurled screws, cannot slip. Machine cut steel compensating gears. Grooves cut in rolls are intended to allow work with a wire to be formed.

NOS.	381A	382A	381A	390A	400A
Length of Rolls, Inches	37	31	43	37	31
Diameter of Rolls, Inches	2	2	2	2½	2½
Weight Each, Lbs.	180	165	200	350	300
Each	$...	...	...	...	...

Note.—Can be furnished with pulleys and legs when ordered. Nos. 390A and 400A, are back geared.

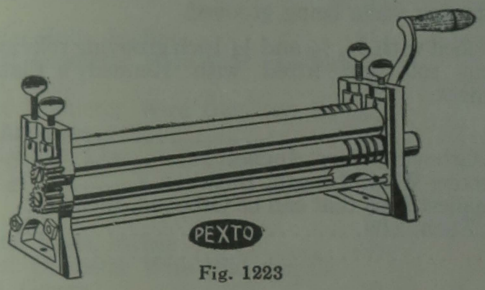


Fig. 1223

SOLID PATTERN

Solid cast iron, japanned, with steel supporting rods; securely bolted; four regulating thumb screws; square hole, heavy crank with plain hardwood handle. Grooves cut in rolls are intended to allow work with a wire to be formed. Adapted for metal up to 22 gauge. Steel rolls turned and finely finished.

NOS.	355	356	357	358	359	361
Length Rolls, Ins.	37	43	31	31	20½	12
Diameter Rolls, Ins	2	2	2	1¾	1½	1
Weight Each, Lbs.	170	180	140	120	60	30
Each	$...	...	...	...	...	...

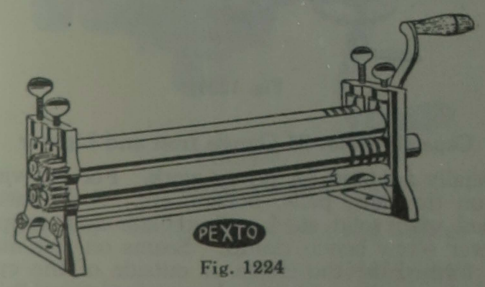


Fig. 1224

Solid cast iron, japanned, with steel supporting rods securely bolted; four regulating thumb screws; equipped with machine cut steel compensating gears so hung that while the gripping rolls are moved the mesh of the gearing is unchanged.

NOS.	372	373	374	380
Length of Rolls, Inches	37	31	31	20
Diameter of Rolls, Inches	2	2	1¾	1½
Weight Each, Lbs.	165	140	120	60
Each	$...	...	...	...

All Above, One in a Box
Prices on Application

FORMING MACHINES

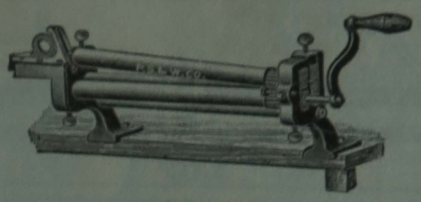


Fig. 1225

FOR TIN PIPE

Made with slip rolls so that work may be readily taken from end after being formed, preventing forcing the work out of shape when being removed from the rolls. Rolls are finely finished, made of special rolled hard steel free from indentations. Gears are machine cut steel.

Frame and bearings are made from a tough mixture of selected gray iron.

Pressure of the gripping roll is regulated by thumb screws.

NOS.	350	351
Length Rolls, Inches	14	20
Diameter Rolls, Inches	1	1
Weight Each, Lbs.	40	50
Each	$....	...

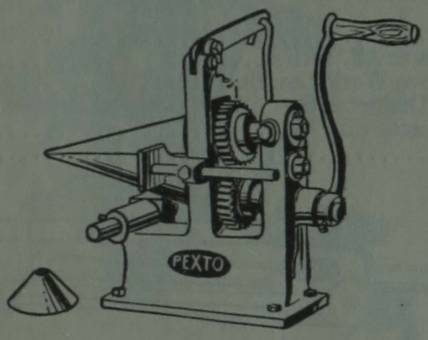


Fig. 1226

FUNNEL FORMER—IMPROVED

Capacity—No. 24 Gauge Iron and Lighter

Intended for forming conical and taper work of various angles such as can tops, funnels, lamp shades, etc. Produce uniform and accurate work. The third or forming roll not shown in cut is adjustable to all positions. The upper roll is depressed by means of a foot treadle and can be adjusted for different thicknesses of material. An adjustable gauge is provided for forming work of various lengths. The rolls are made from special rolled hard steel, smoothly finished and free from indentations.

NO.	459
Length of Forming Roll, Inches	10
Smallest Diameter That Can be Formed on Small End	⅝
Smallest Diameter That Can be Formed on Large End	3
Weight Each, Lbs.	100
Each	$...

Frames and bearings are of a tough mixture of selected iron; gears of machine cut steel; square hole crank with a set screw is used which allows turning either way without danger of backing off as is the case when a threaded crank is used.

CAPACITIES OF FORMING MACHINES

This is governed by the length and smallest diameter of the cylinder to be formed with the diameter of rolls in the machine. The larger the cylinder the easier it will form. When stock is stiff it is better to form it gradually than to try and secure the correct diameter in one pass.

All Above, One in a Box
Prices on Application

GROOVING MACHINES

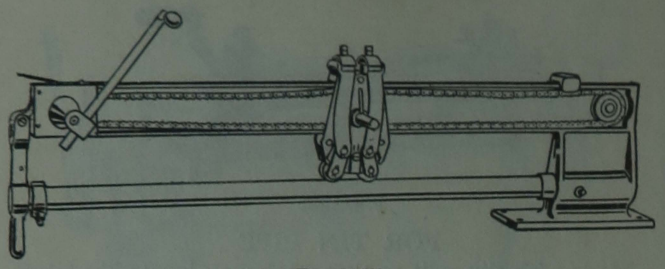


Fig. 1227

Capacity—No. 24 Gauge Iron and Lighter

For grooving longitudinal seams in stove pipe and other sheet metal cylinders; the traveling carriage has two rolls, one for grooving and one for flattening the seam at same operation. Frame and rack standard cast iron, Japanned; grooving horns and supporting bars made of high grade machine steel, grooving rolls of special steel; Japanned Steel adjustable crank with hardwood handle.

Six grooving rolls are furnished; one each for 3/16, 7/16 and 15/32 inch grooves; two with 5/16 inch grooves and one flattening tool.

NO.	518A
Length Over All, Inches	54
Will Groove Work Length, Inches	30
Smallest Diameter that can be Grooved, Inches	2
Weight Each, Lbs.	200
Each	$....

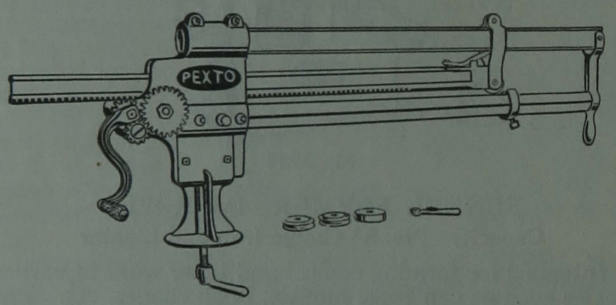


Fig. 1228

HEAVY BACK GEARED

Capacity—No. 514, No. 20, No. 515, No. 22, Gauge Iron and Lighter

Built for heavy work. Grooving horn is reversible so that either the flat surface or one of the grooves that is planed into the horn can be turned upward for the purpose of locating seam on the inside or outside of work. An adjustable stop is provided on bar to prevent work from slipping while being grooved.

Frame and rack standard cast iron, Japanned; grooving horns and supporting bars made of high grade machine steel, grooving rolls on special steel; Japanned steel crank with hardwood handle.

No. 515 is fitted with Kennedy's Flattening Attachment. Three grooving rolls, one each 5/16, 3/8 and 7/16 inch and one flattening roll are furnished.

NOS.	514	515
Length Grooving Horn, Inches	41¾	41¾
Will Groove Work Length, Inches	37	25
Dia. Smallest Pipe that can be Grooved, Inch.	2⅝	2⅝
Ratio of Gearing	2 to 1	2 to 1
Weight Each, Lbs.	285	295
Each	$....	....

All Above, One in a Box
Prices on Application

GROOVING MACHINES

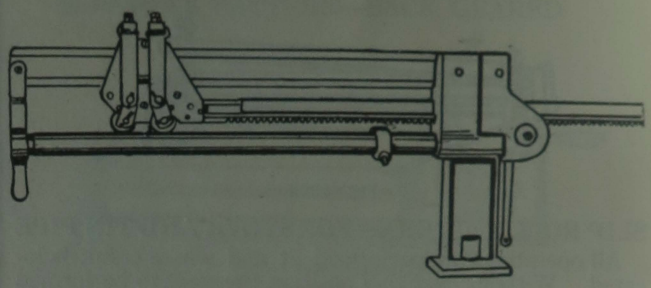


Fig. 1229

Capacity—No. 22 Gauge Iron and Lighter

For general grooving and have an improvement consisting of an attachment which grooves and flattens the seams of cylinders in one operation. Lower bar or horn is reversible so that either the flat surface or one of the grooves which is planed into the horn can be turned upward permitting for the locating of seams on the inside or the outside of the work. The seam is put on the inside of work by means of flat rolls which press the seam into one of the grooves planed in the horn, outside grooving is done in the usual manner by using the grooved rolls on flat surface of horn. An adjustable stop collar is fitted on lower horn to prevent work slipping while being grooved.

Furnished with 3/8, 5/32 and 1/4 Inch grooving rolls and one flattening roll and fitted with Kennedy's Flattening Attachment.

NOS.	506A	507A
Length Grooving Horn, Inches	33½	43½
Will Groove Work Length, Inches	21½	31½
Dia. Smallest Pipe that can be Grooved, Inch.	2	2
Weight Each, Lbs.	151	175
Each	$....	....

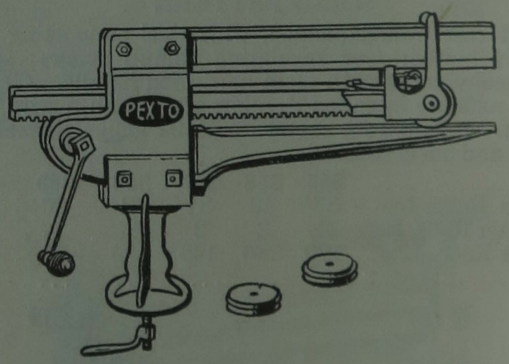


Fig. 1230

Capacity—No. 24 Gauge Iron and Lighter

Especially adapted for heavy work. For grooving the seams on tin cans, pails, boilers, etc. Solid cast iron, Japanned with solid steel rolling plate and supporting bar; lever screw bench clamp. Seams on this machine can be formed on the inside or outside of the cylinder and can be used on all vessels not less than 2 inches in diameter.

NO.	502
For Iron Width, Inches	20
Size of Groove Rolls, Inch.	1/8, 5/32, 7/32
Size Grooving Horn, Large End, Inches	3
Size Grooving Horn, Small End, Inches	1⅝
Height Over All, Inches	11½
Weight Each, Lbs.	102
Each	$....

All Above, One in a Box
Prices on Application

TURNING MACHINES

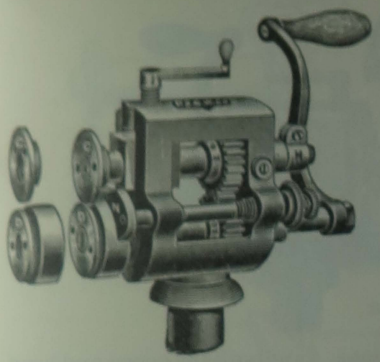


Fig. 1231

Solid cast iron Japanned frames, hardened steel gearings and rolling faces, with adjustable boxes and adjusting screws. Complete with wood handle and malleable iron crank. By a patented arrangement the upper journal boxes are so constructed that the faces readily pass over seams without straining the machine or injuring the work. Crank screws that raise and lower the upper shaft are forged from a high grade steel; gauges are forged from hardened tool steel. Rolls are removable from the shafts and are forged from a tough, special, high-grade steel properly hardened.

Used in preparing vessels for wiring and in putting stovepipe elbows together; two sets faces are furnished; one set each thick and thin.

Capacity—No. 22 Gauge Iron and Lighter

NOS.	540	540½	541
Diameter Rolls, Inches	1½	1½	2 1/16
Smallest Diameter Wire that can be Used, Gauge	10	10	10
Largest Diameter Wire that can be Used, Gauge	7	7	7
Weight Each, Lbs.	22	11	25
Each	$...	...	...

NOS.	541½	542	542½
Diameter Rolls, Inches	2 1/16	3	3
Smallest Diameter Wire that can be Used, Gauge	10	8	8
Largest Diameter Wire that can be Used, Gauge	7	4	4
Weight Each, Lbs.	14	31	20
Each	$...	...	...

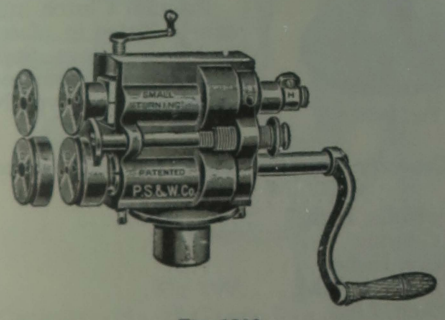


Fig. 1232

Encased Pattern

Capacity—No. 24 Gauge Iron and Lighter

NOS.	545	545½	546	546½
Diameter Rolls, Inches	2 1/8	2 1/8	3	3
Smallest Diameter Wire that can be Used, Gauge	10	3/32	8	1/8
Largest Diameter Wire that can be Used, Gauge	7	1/4	4	5/16
Weight Each, Lbs.	23	12	28	17
Each	$...	...	...	...

Nos. 545½ and 546½ are the same as Nos. 545 and 546 but are furnished without standards.

All Above, One in a Box
Prices on Application

WIRING MACHINES

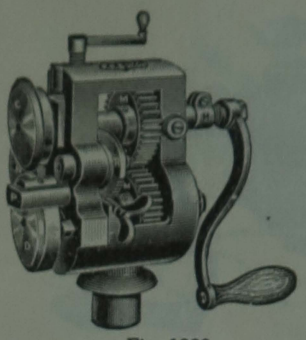


Fig. 1233

For working metal around wire after the seat has been prepared with turning machine.

No. 525½ is the same as No. 525 but is furnished without standard.

Capacity—No. 22 Gauge Iron and Lighter

NOS.	525A	525½A
Diameter Rolls, Inches	3	3
Will Receive Wire up to Diameter, Gauge	0	0
Weight Each, Lbs.	31	20
Each	$...	...

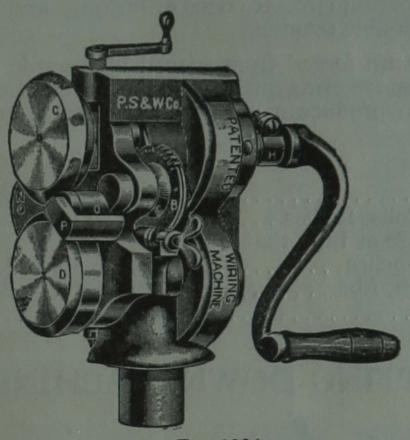


Fig. 1234

Encased Pattern

NOS.	526	526½
Diameter Rolls, Inches	3	3
Will Receive Wire up to Diameter, Gauge	0	0
Weight Each, Lbs.	28	17
Each	$...	...

No. 526½ is the same as No. 526 but without standard.

BURRING MACHINES

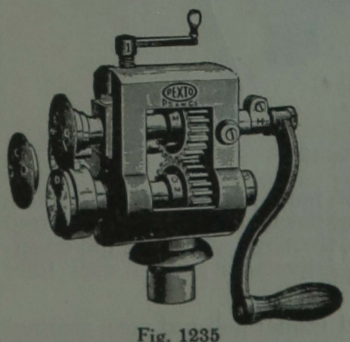


Fig. 1235

Used for turning up edges on vessels; after which they are finished on the setting down machine; faces pass over seams without straining; the rolls are forged from special high grade material giving extreme wearing qualities to the fine edge in the rolls necessary to produce a uniform flange on a number of blanks. Furnished with extra upper face.

Capacity—No. 22 Gauge Iron and Lighter

NOS.	576A	576½A	577A	577½A
Diameter Rolls Inches	1½	1½	2 1/8	2 1/8
Widest Flange or Burr that can be Turned, Inches	3/16	3/16	1/4	1/4
Weight Each, Lbs.	21	10	25	14
Each	$...	...	...	...

All Above, One in a Box
Prices on Application

BURRING MACHINES

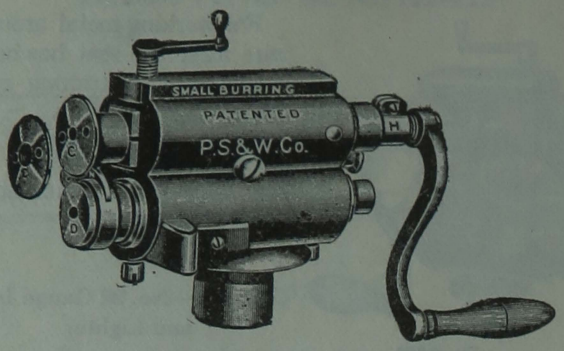


Fig. 1236

ENCASED PATTERN

Capacity—No. 24 Gauge Iron and Lighter

For creasing, edging rims of covers for pails, boilers, and for preparing circular edges of bottoms and bodies of vessels for double seaming.

The rolls are forged from special high grade material, giving extreme wearing qualities to the fine edge in the rolls necessary to produce a uniform flange on a number of blanks.

NOS.	579	579½	580	580½
Diameter Rolls, Inches	1½	1½	2⅛	2⅛
Widest flange or burr that can be Turned, Inches	3/16	3/16	¼	¼
Weight Each, Lbs.	21	10	23	12
Each $				

SETTING-DOWN MACHINES

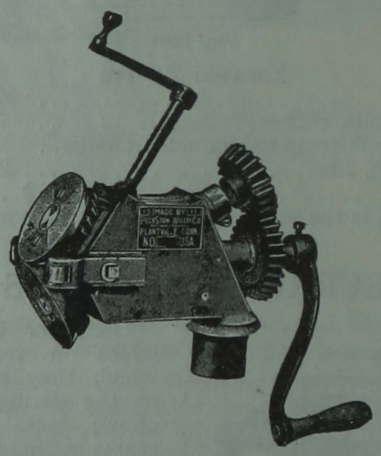


Fig. 1237

The inclined position of both upper and lower faces allows work to be held up or down and seams to be started inward while setting down, thereby facilitating the operation of double seaming. Adjustable gauges with Idler rollers are furnished.

Solid cast iron Japanned frame; polished steel gearings and rolling faces with adjustable screws, Japanned iron crank with plain hardwood handle.

NOS.	561	562
Capacity Gauge Iron and Lighter Nos.	24	18
Ratio of Gearing		2 to 1
For seams up to, Inch	⅜	½
Weight Each, Lbs.	50	100
Each $		

All Above, One in a Box
Prices on Application

ELBOW EDGING MACHINES

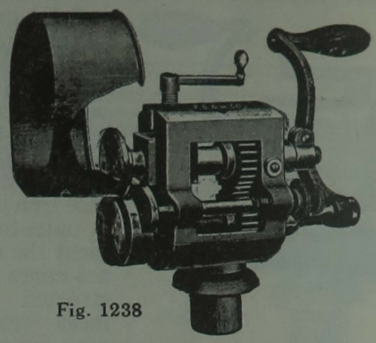


Fig. 1238

For edging elbow sections; form both the crease and bead for uniting the two sections.

Solid cast iron Japanned frame; polished steel gearings and rolling faces with adjustable screws; Japanned iron crank with plain hardwood handle.

Capacity—No. 24 Gauge Iron and Lighter

NOS.	550A	551A
Diameter Rolls, Inches	1½	2⅛
Weight Each, Lbs.	21	25
Each $		

HEAVY POWER—BACK GEARED TYPE

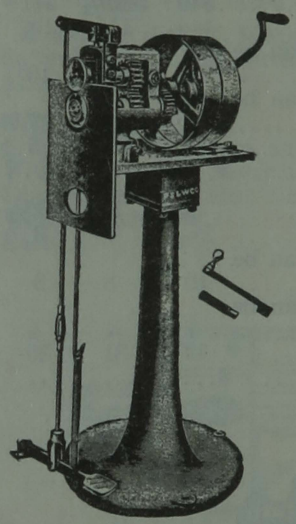


Fig. 1239

For edging elbow sections with maximum speed, ease and accuracy. The frame and iron column to which the head is fastened are patterned to give perfect rigidness to machine while in operation. The depression of rolls may be actuated through either crank screw or depression of foot treadle. Tight and loose pulleys and crank are fitted. The apron gauge facilitates more perfect edging. The connecting gears are of machine cut steel and driving gears are cut from solid cast iron.

Friction Clutch attachment can be fitted in place of tight and loose pulleys. Style of rolls desired must accompany orders, or edging Rolls type No. 1 will be sent.

Capacity—No. 20 Gauge Iron and Lighter

NO.	552
Diameter Rolls, Inches	3¼
Ratio of Gearing	2 to 1
Size Pulleys, Inches	12x2½
Speed Pulleys, R.P.M.	60
Weight Each, Lbs.	282
Each	$

Regularly Crated, Extra Charge for Boxing

ELBOW EDGING ROLLS

Rolls type No. 1 as shown in above cut produce V-shaped edges on both elbow sections. Rolls type No. 2 are desirable for edging inside and outside sections of riveted elbows with tight or loose joint. Rolls type No. 5 can be used for the outer edge of riveted or grooved elbows. The inner edge should be turned on Regular Burring machine or with Rolls design type No. 6. Rolls type Nos. 3 and 4 are preferable for elbows riveted or grooved with loose joint.

These patterns are best suited for light work and meet the requirements of the tinsmith and sheet metal worker.

Where specifications do not accompany orders, rolls in design No. 1 will be furnished.

Prices on Application

ELBOW SEAM CLOSERS

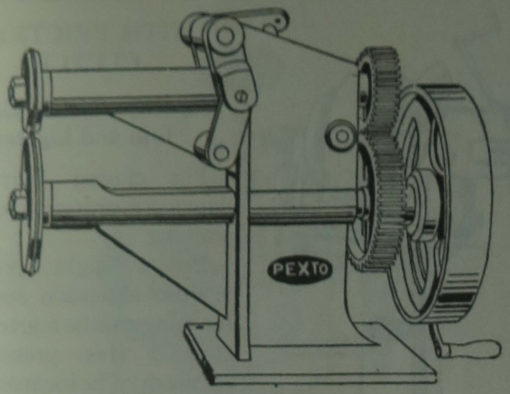


Fig. 1240

BACK GEARED

Capacity—No. 24 Gauge Iron and Lighter

A compact, strong, efficient elbow seam closer intended for closing and tightening the circular seams of pieced elbows of large diameter, either tight or loose after the edges are prepared with the elbow edging machine and the joints put together. The upper shaft is depressed by a foot treadle attachment.

One pair of rolls for either tight or loose seams are fitted. When ordering, specify style of seam required. Tight pulley with crank are fitted with No. 661. No. 663 is made for hand power.

	Power	Hand
NOS.	661A	663A
Diameter Rolls, Inches	7¼	7¼
Depth Throat, Inches	15½	15½
Suitable for Elbows, Diameter, Inches	8 to 12	8 to 12
Size Pulley, Inches	12x3	
Weight Each, Lbs.	270	255
Each	$	

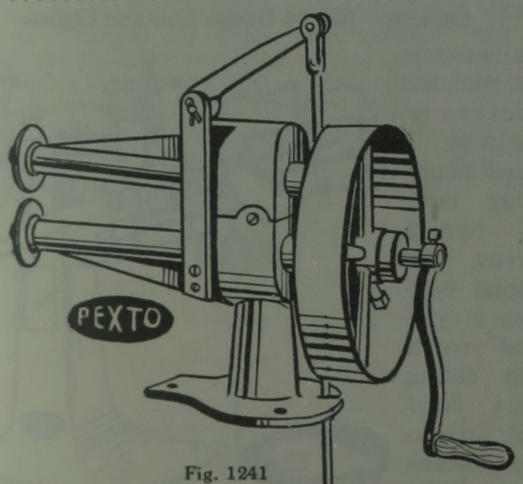


Fig. 1241

Capacity—No. 26 Gauge Iron and Lighter

These machines are intended to close and tighten the circular seam of pieced elbows either tight or loose after the edges are prepared with the elbow edging machine and the joints put together. The upper shaft is depressed through a foot treadle attachment.

One pair of rolls for either tight or loose seams are fitted. When ordering, specify style of seam required. Tight pulley and crank are fitted with No. 660. No. 662 is made for hand power.

	Power	Hand
NOS.	660A	662A
Diameter Rolls, Inches	3¾	3¾
Depth Throat, Inches	9	9
Suitable for Elbows, Diameter, Inches	4 to 7	4 to 7
Size Pulley, Inches	10x3	
Weight Each, Lbs.	125	110
Each	$	

All Above, One in a Box **Prices on Application**

BURRING MACHINES

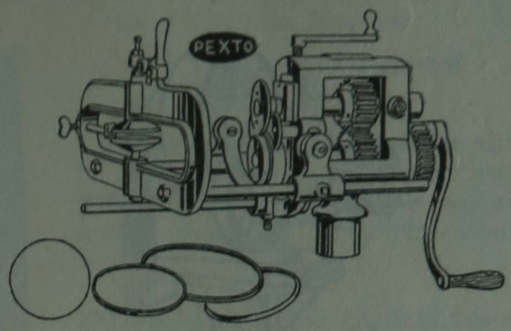


Fig. 1242

WITH CIRCULAR ATTACHMENT—BACK GEARED

Circular attachments as fitted to these machines will permit for more perfect flanging. Round discs to be flanged are clamped in the Yoke through a quick acting eccentric lever device. The Yoke is gradually raised until the flange is turned as far as desired.

Where specifications do not accompany orders, rolls will be fitted for turning ¼ inch flange on No. 20 Gauge Iron.

	Hand		Power	
	With Circ. Attach.	Without Circ. Attach.	With Circ. Attach.	Without Circ. Attach.
NOS.	583	584	583½	584½
Diam. Rolls, Inches	3¼	3¼	3¼	3¼
Ratio of Gearing	2 to 1	2 to 1	2 to 1	2 to 1
Size Pulley, Inches			12x2½	12x2½
Speed of Pulley, R.P.M.			60	60
Weight Each, Lbs.	155	115	180	155
Each	$			

Note—Nos. 583½-584½ are fitted with tight pulley.

TURNING AND WIRING MACHINES

Capacity—No. 18 Gauge Iron and Lighter

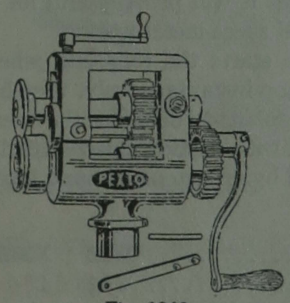


Fig. 1243

These machines are made from heavy patterns and with the proper rolls and gauges they are suited for a variety of operations. Machine cut steel connecting gears are used and the driving gears are cut from solid cast iron. Frames are extra heavy and the machine throughout is proportioned for giving the very best of satisfaction up to the full rated capacity.

Where specifications do not accompany orders, turning machines will be furnished with turning rolls for 3/16 inch wire and No. 20 gauge iron regularly.

Extra heavy standard No. 977 is furnished.

Nos. 547½-548½ Turning and Wiring Machines are constructed for power and fitted with tight pulley. Rolls are interchangeable.

	Hand		Power	
	Turning	Wiring	Turning	Wiring
NOS.	547	548	547½	548½
Diam. Rolls, Inches	3¼	3¼	3¼	3¼
Ratio of Gearing	2 to 1	2 to 1	2 to 1	2 to 1
Size of Pulley, Inches			12x2½	12x2½
Speed of Pulley, R.P.M.			60	60
Smallest diam. wire that can be used, inch	3/16	3/16	3/16	3/16
Largest diam. wire that can be used, inch	5/16	5/16	5/16	5/16
Weight Each, Lbs.	115	115	155	155
Each	$			

All Above, One in a Box **Prices on Application**

TURNING AND WIRING MACHINES

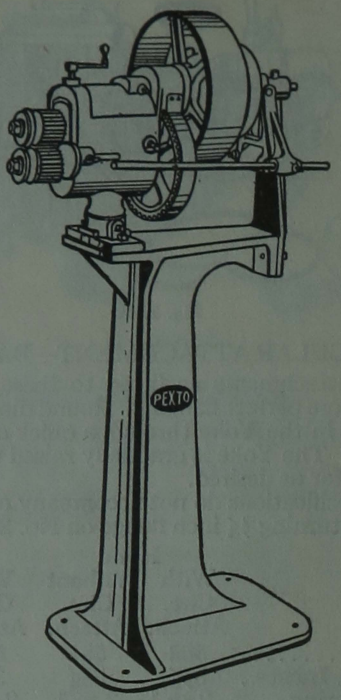


Fig. 1244

WITH FRICTION CLUTCH

Capacity—No. 16 Gauge Iron and Lighter

A compact and exceedingly strong turning and wiring machine designed for heavy duty. The small diameter of the rolls in this machine permits for the wiring of heavy work with a small radius. The shafts are heavy and machine cut gears are used.

With special rolls and gauges it will prove useful for a variety of operations in general sheet metal work.

A depression of the treadle starts the rolls and when pressure is released the rolls stop instantaneously, thereby causing the operation of the machine to be under the operator's instant control. Fitted with friction clutch attachment which may be controlled by an extension hand lever if so ordered.

NOS	0532	X532
Diameter Rolls, Inches	2⅜	2⅜
Smallest diam. wire that can be used, Inches	⅛	⅛
Largest diam. wire that can be used, Inches	5/16	5/16
Ratio of Gearing	4½ to 1	4½ to 1
Size Pulley, Inches	12x3	12x3
Speed Pulley, R.P.M.	75	75
Weight Each, Lbs.	350	325
Each	$....	.....

Gearing of rolls encased within the body of the machine while outside driving gears are protected by a fixed, cast iron guide.

NOTE.—No. 0532 shipped as shown in cut, No. X532 has tight and loose pulleys; Turning and wiring rolls for ¼-inch wire and No. 16 gauge iron will be sent unless otherwise specified.

All Above, One in a Box
Prices on Application

SETTING DOWN MACHINES

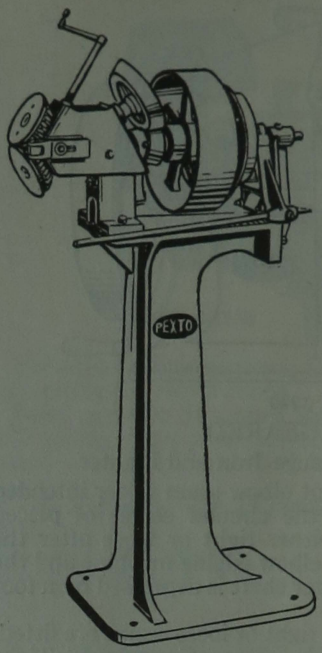


Fig. 1245

WITH FRICTION CLUTCH

Capacity—No. 18 Gauge Iron and Lighter

For closing burr and flange preparatory to double seaming.

By a slight pressure against extension rod, the machine can be started and stopped when pressure is released. The inclined position of both upper and lower faces allows work to be held up or down and seams can be started inward while setting down. Adjustable gauge with idle rollers guide seam while closing down.

NO.	0564
For Seams Up to, Inches	½
Ratio of Gearing	2-1
Size Pulley, Inches	12x3
Speed of Pulley, R.P.M.	40
Weight Each, Lbs.	310
Each	$.....

FLANGING MACHINES

Capacity—No. 14 Gauge Iron and Lighter

A serviceable, rigid and accurate arrangement is secured for producing beading, turning, wiring and flanging operations in cylindrical work. With cutting discs fitted, they prove very desirable rotary slitting shears.

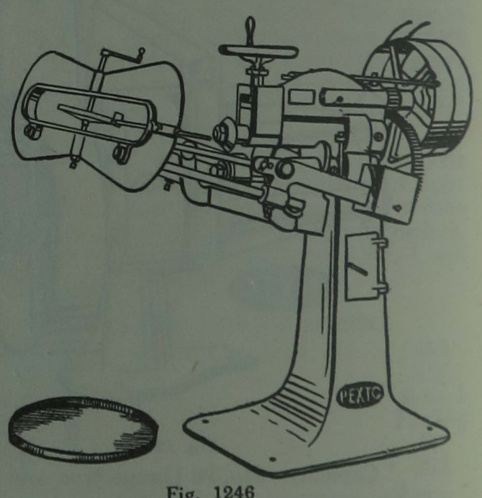


Fig. 1246

Furnished regularly with tight and loose pulleys unless otherwise specified.

NOS	633	634
Diameter Rolls, Inches	4½	4½
Ratio of Gearing	4½-1	4½-1
Diameter Pulleys, Inches	16	16
Depth Throat, Inches	10½	10½
Will Flange Bottoms, Diam., Inches	12 to 30	12 to 50
Will Turn Flanges, Inches	5/8,¾,⅞,1,1¼	5/8,¾,⅞,1,1¼
With Turning and Wiring Rolls, Wire may be used up to, Inches	⅛	⅛
Weight Each, Lbs.	1000	1100
Each	$.....	.....

Regularly Crated—Extra Charge for Boxing
Prices on Application

REVOLVING MACHINE STANDARDS

HOLDALL

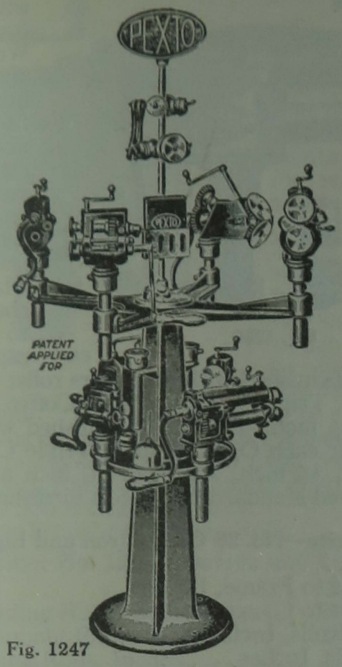


Fig. 1247

Illustrating standard with machines mounted.

Provides a place for every tool and machine attachment.

Revolving turret holds four machines; four operations can be completed without changing positions; has hand lever for holding revolving turret in a fixed, stationary position; adjustable machine holders that raise, lower and swivel for suiting operating convenience of machines for the short and tall operator as well as the work in process; lower stationary turret for holding four additional machines arranged for quick interchanging with any machine set in upper revolving turret; this lower turret also provides for a handy shelf, holding oil can, tools, etc.

Cast iron; painted black; standard only. **Each**

NO. 969—Height to Revolving Turret, 39 Inches; Diameter Base, 16 Inches; Weight each, 268 Lbs..... $....

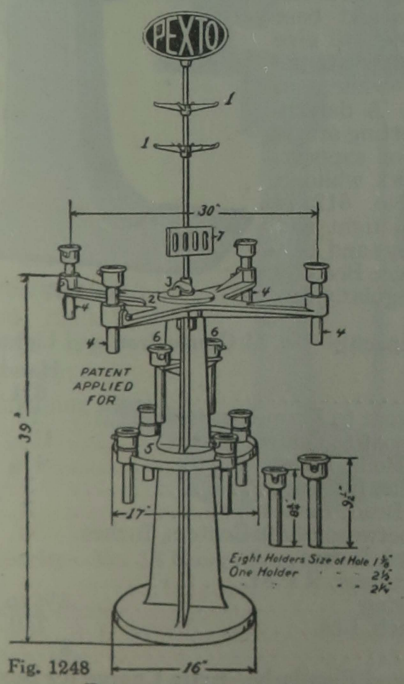


Fig. 1248

Prices on Application

MACHINE STANDARDS

Heavy Cast Iron, Japanned

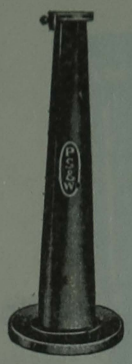


Fig. 2149

FLOOR STANDARDS

Heavy Type

Can be arranged to receive bench machines in all types. When ordering for machines already in use, size of hole required or number and kind of machine should be specified.

Each

NO. 979—Height Over All, 39 Inches; size hole 2¼ and 2½ inches; Weight Each, 90 Lbs..... $.....

Light Type

Similar to above standards but light in weight. Will receive machines having stems 1⅝ inches in diameter. When correct number of machine is given hole dimensions are not necessary.

Each

NO. 984—Height Over All 39 Inches; Size Hole 2⅝ Inches; Weight Each, 50 Lbs..... $.....

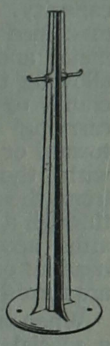


Fig. 1250

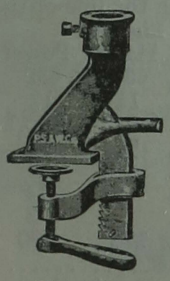


Fig. 1251

EXTRA HEAVY

Furnished regularly with No. 562 setting down machine and heavy wiring, turning, elbow edging machines. With quick adjustable bottom clamp.

NOS.	977	978
Size of Hole	2¼	2½
Height Over All from Bench, Inches	10⅛	9⅞
Weight Each, Lbs.	23	24
Each	$...	....

REGULAR OFFSET

Furnished with regular and encased pattern bench machines.

Each

NO. 975—Size of Hole, 1⅝ Inches; Height Over All from Bench, 9¾ Inches; Weight Each, about 10½ Lbs..... $.....

Fig. 1252

Fig. 1253

WIRING OFFSET

Furnished with regular and encased pattern bench machines.

Each

NO. 976—Size of Hole, 1⅝ Inches; Height Over All from Bench, 9¾ Inches; Weight Each, about 11 Lbs..... $.....

All Above Packed Loose

Prices on Application

BEADING MACHINES

HEAVY BENCH TYPES

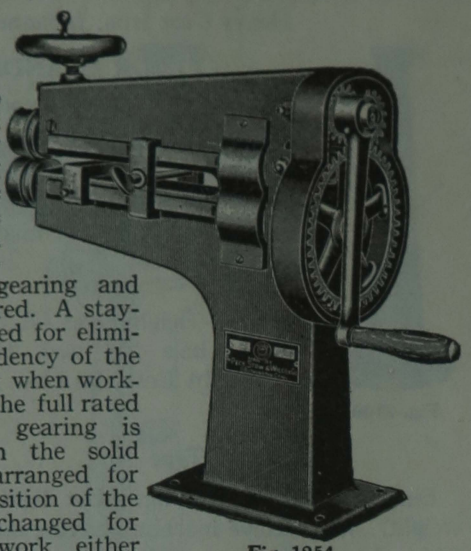


Fig. 1254

Designed to meet a demand for a heavy duty bench beading machine. The frame and base are made from one solid casting and the gearing and shafts are covered. A stay-clamp is provided for eliminating any tendency of the frame to spring when working iron up to the full rated capacity. The gearing is machined from the solid metal and so arranged for allowing the position of the crank to be changed for carrying the work either toward or from the operator with the crank always moving in one direction from the operator. The depression of rolls is secured through a convenient hand wheel. Detachable supporting arms accompany each machine to facilitate accurate beading on cylindrical work. Two pairs of beading rolls are furnished.

When ordered for power with friction clutch attachment a special pulley is used. This attachment is operated through a foot treadle for instantaneous stopping and starting of the machine at any point along the line of the work. **Capacity—No. 16 Gauge Iron and Lighter.**

	Hand	Power
NOS	631	632
Depth Throat, Inches	11	11
Ratio of Gearing	3 to 1	3 to 1
Size Single Bead in Rolls, Inches	3/8	3/8
Size Ogee Bead in Rolls, Inches	1	1
Diameter Pulley, Inches		14
Face Pulley, Inches		3
Weight Each, Lbs.	175	190
Each	$	

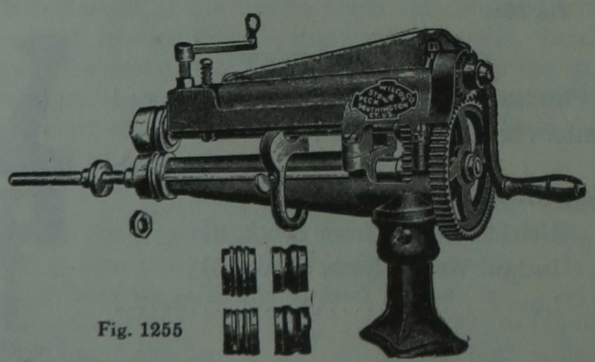


Fig. 1255

Solid cast iron reinforced frame; Japanned finish; polished steel gearing and rolls; with adjustable screw; malleable iron crank with wood handle.

Capacity—No. 20 Gauge Iron and Lighter.

NOS.	617B	618B	619B
Depth Throat to Frame, Inches	13	10 1/4	7 1/2
Depth Throat to Gauge, Inches	12	9 3/8	6 3/4
Distance between Shaft Cent. In.	2 5/8	2 5/8	2 1/4
Diameter Rolls, Inches	2 3/4	2 3/4	2 3/8
Width Rolls, Inches	1 7/8	1 7/8	1 5/8
Ratio Gearing	3 1/3 to 1	3 1/3 to 1	2 1/2 to 1
Size Single Bead in Rolls, Inches	3/8	3/8	5/16
Size Ogee Bead in Rolls, Inches	1	1	7/8
Size Triple Bead in Rolls, Inches	1	1	7/8
Weight Each, Lbs.	140	125	85
Each	$		

One in a Box **Prices on Application**

BEADING MACHINES

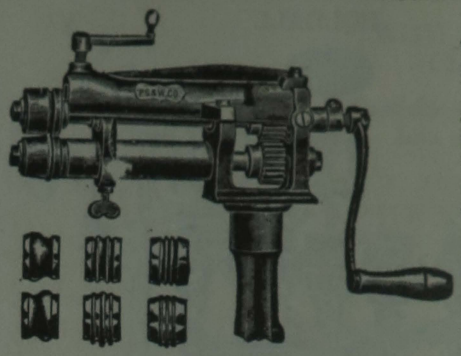


Fig. 1256

Constructed with reinforced frames and caps. Well suited for accurate beading up to their full rated capacity. A stay-clamp is provided for eliminating any tendency of the frame to spring when working sheet iron up to the full rated capacity.

No. 620 is furnished with four pairs rolls; one pair each Ogee 3/4 inch, Triple 5/8 inch, Triple Coffee Pot, 1/2 inch, and Single, 3/16 inch. No 621 is furnished with five pairs rolls; one pair each Ogee 7/16 inch, Triple Coffee Pot, 3/8 inch, Double, 1/8 inch, Astragal, 7/16 inch and single, 1/8 inch. Improved standard No. 975 is furnished.

Capacity—No. 26 Gauge Iron and Lighter.

NOS.	620	621
Depth Throat to Frame, Inches	6 1/4	4 3/4
Depth Throat to Gauge, Inches	5 1/2	4
Diameter of Rolls, Inches	1 15/16	1 1/2
Width of Rolls, Inches	1 7/8	1
Distance between Shaft Centers, Inches	1 7/8	1 7/16
Weight Each, Lbs.	50	40
Each	$	

HEAVY—BACK GEARED TYPE

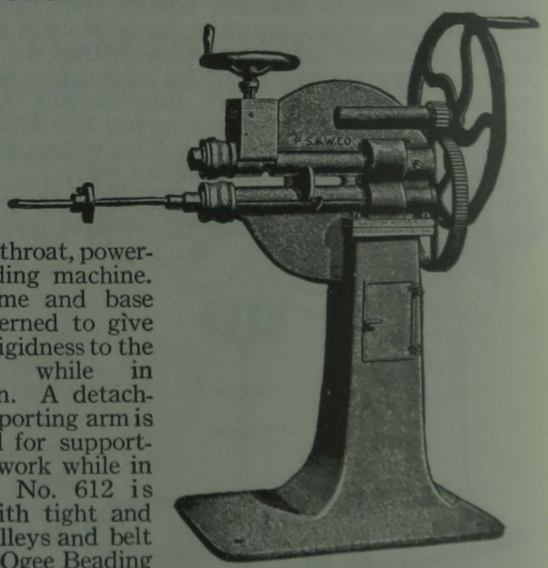


Fig. 1257

A deep throat, powerful, beading machine. The frame and base are patterned to give perfect rigidness to the machine while in operation. A detachable supporting arm is provided for supporting the work while in process. No. 612 is fitted with tight and loose pulleys and belt shifter. Ogee Beading rolls are regularly furnished.

Capacity—No. 14 Gauge Iron and Lighter.

	Hand	Power
NOS.	611	612
Depth Throat to Frame, Inches	12	12
Depth Throat to Gauge, Inches	10 1/4	10 1/4
Diameter Rolls, Inches	4 3/16	4 3/16
Width Rolls, Inches	3	3
Size Ogee Bead, Inches	2	2
Distance between Shaft Centers, Inches.	4	4
Size Pulleys, Inches		16x3
Speed of Pulleys, R.P.M.		90
Ratio Gearing	4 1/2 to 1	4 1/2 to 1
Weight Each, Lbs.	740	745
Each	$	

Crated Regularly—Extra Charge for Boxing

Prices on Application

CRIMPING AND BEADING MACHINES

HEAVY GEARED TYPE

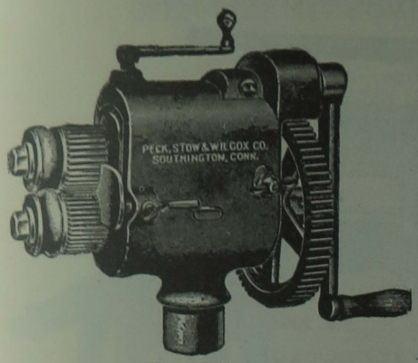


Fig. 1258

Made for heavy duty; produce snug fitting pipe joints that hold when put together. Adjustments are provided for regulating the relative depth of crimp and bead. This adjustment will be found in a wedge between the rear bearings. This wedge is adjusted by wing nuts in front and back of frame near handle end The upper shaft can be tipped toward front or back as desired, thus making a deep crimp and shallow bead or shallow crimp and deep bead.

Furnished with Extra Heavy Standard No. 977
No. 601 has Spiral Crimping Rolls.
No. 0601 has Straight Crimping Rolls.

Capacity—No. 18 Gauge Iron and Lighter

NOS.	601	0601
Diameter Beading Rolls, Inches	$2\frac{13}{16}$	$2\frac{13}{16}$
Diameter Crimping Rolls, Inches	$2\frac{11}{16}$	$2\frac{11}{16}$
Width Crimping Rolls, Inches	$1\frac{3}{4}$	$1\frac{3}{4}$
Width Beading Rolls, Inches	$1\frac{1}{4}$	$1\frac{1}{4}$
Ratio of Gearing	$4\frac{1}{3}$ to 1	$4\frac{1}{3}$ to 1
Distance between Shaft Centers, Inches	$2\frac{5}{8}$	$2\frac{5}{8}$
Weight Each, Lbs.	125	125
Each	$	....

HEAVY POWER TYPE, WITH FRICTION CLUTCH ATTACHMENT

Similar to Nos. 601 and 0601 but are made for power and equipped with friction clutch attachment for instantaneous starting and stopping on the machine, which brings the machine and work constantly under the operator's control. Easy of operation, strong and rigid. No. $601\frac{1}{2}$A has spiral, No. 0601A, straight crimping rolls.

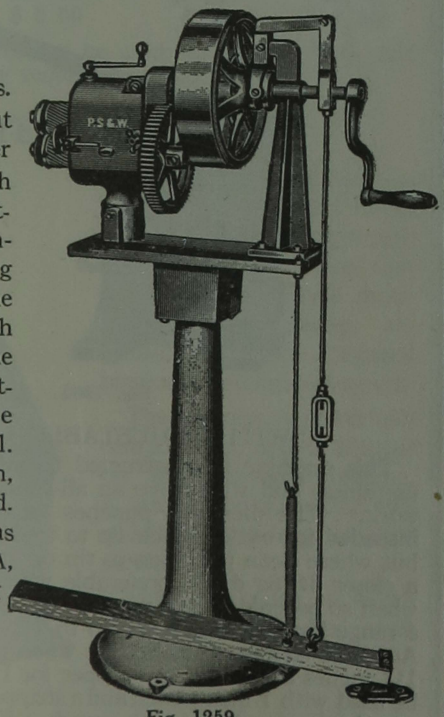


Fig. 1259

Capacity—No. 18 Gauge Iron and Lighter

NOS.	$601\frac{1}{2}$A	$0601\frac{1}{2}$A
Size of Pulley, Inches	12x3	12x3
Speed of Pulley, R. P. M.	60	60
Weight Each, Lbs.	310	310
Each	$...	...

All Above, One in a Box **Prices on Application**

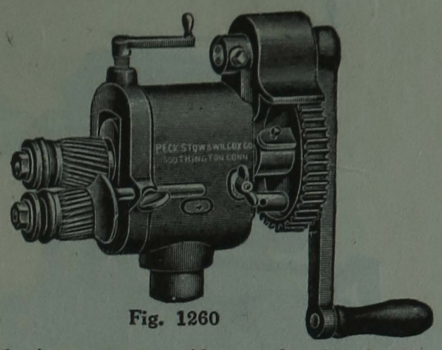


Fig. 1260

For producing a neat uniform crimping bead or crimp without bead; two speeds are provided; back geared for heavy stock and direct drive when lighter gauge material is used. The upper shaft can be tipped toward front or back as desired thus making a deep crimp, shallow spread or shallow crimp, and deep bead blank collars are furnished and may be substituted in place of beading rolls where crimping alone is desired. A naught (0) before number indicates straight crimping rolls.

Capacity—No. 20 Gauge Iron and Lighter

NOS.	585A	0586A	587A	0588A
Diameter Beading Rolls, Inches	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$	$1\frac{15}{16}$
Diameter, Crimping Rolls, Ins.	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$
Width Crimp Rolls, Inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Width Bead Rolls, Inches	1	1	1	1
Distance between Shaft Centers; Inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Shipping Weight, lbs.	65	65	85	85
Each	$...	...	...	...
NOS.	**591A**	**0592A**	**593A**	**0594A**
Diameter Crimping Rolls, Ins.	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{13}{16}$
Width Crimp Rolls, Inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Distance between Shaft Centers, Inches	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$	$1\frac{3}{4}$
Weight Each, Lbs.	63	63	83	83
Each	$...	...	...	...

CRIMPING MACHINES

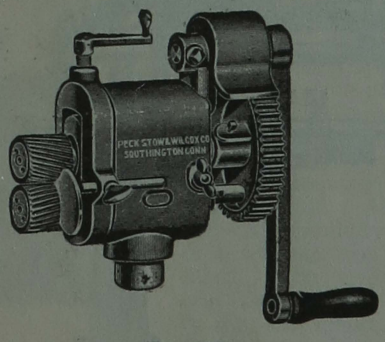


Fig. 1261

Are intended to facilitate the making and putting together sheet iron pipe of different diameters. The rolls are attached to arbors in a manner that leaves the ends or faces of the rolls flat or flush making them adapted for crimping close up to a bend or angle and are constructed for crimping only. No. 603 has spiral, No. 0603 straight crimping rolls.

Capacity—No. 18 Gauge Iron and Lighter

NOS.	603	0603
Diameter Crimping Rolls, Inches	$2\frac{11}{16}$	$2\frac{11}{16}$
Width Crimping Rolls, Inches	$1\frac{3}{4}$	$1\frac{3}{4}$
Ratio of Gearing	$4\frac{1}{3}$ to 1	$4\frac{1}{3}$ to 1
Distance between Shaft Centers, Inches	$2\frac{5}{8}$	$2\frac{5}{8}$
Weight Each. Lbs.	120	120
Each	$...	...

All Above, One in a Box **Prices on Application**

CORRUGATING MACHINES

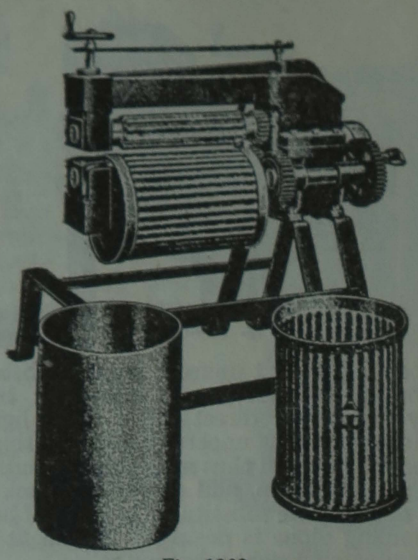


Fig. 1262

FOR ASH AND REFUSE CANS

Capacity—No. 20 Gauge Metal and Lighter

The work is placed between the corrugating rolls and the upper, or adjustable, roll is brought down into contact with the work by turning a handwheel which manipulates two adjusting screws through the medium of a sprocket drive. Power is transmitted from the driving shaft through back-gears; both the upper and lower corrugating rolls are provided with positive geared drives. Both the corrugating rolls and the driving gears are made of steel. **Each**

NO. 1040—Rollers are made for barrels 24 Inches High with a 20 Inch Corrugation, 1½ Inch pitch; Floor Space, 4x3 Feet, 6 Inches. Weight Each, 1800 Lbs.....$.....

DOUBLE SEAMING MACHINES

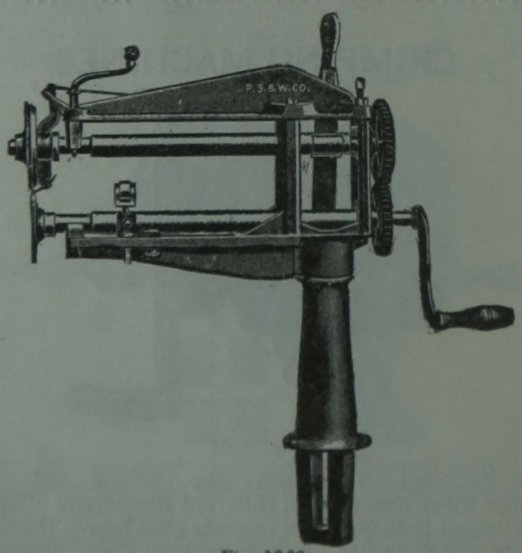


Fig. 1263

MOORE'S PATENT

Capacity—No. 26 Gauge Iron and Lighter

The size of the lower face determines the smallest size bottom that can be double seamed. With these machines extra discs are not required. They are simple in construction and easy to operate. Adapted for general use.

NOS.	644	645	646
Will Receive Work in Depth, Inches..	15½	13½	10
Size Lower Seaming Face, Inches.....	4½	4	3
Weight Each, Lbs.....	100	75	60
Each.....$	.....	.....	.....

One in a Box **Prices on Application**

METAL PUNCHES

LEVER OPERATED TYPES

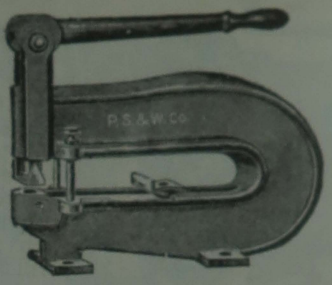


Fig. 1264

WITH ADJUSTABLE GAUGE

Exceptionally useful machines with deep throats for general work. Dies and punches are of the finest crucible tool steel and will cut to their full-rated capacity. Frame made of cast iron; with wrought iron links; fastened to bench with bolts; when large sheets are to be punched the stay bolts are removed. **Each**

NO. 675—Depth of Gap, 15 Inches; will punch No. 9 Iron and to center of 7 Inch Sheets, when Stay Bolts are in place; will punch No. 12 Iron and to the center of 30 Inch Sheets with Stay Bolts removed; Complete with Three Sets of Dies and Punches, Sizes, ⅛, 3/16 and ¼ Inch; Weight Each, 140 Lbs.....$.....

NO. 676—Depth of Gap, 15 Inches; will punch ⅜ Inch Iron and to center of 7 Inch Sheets, when Stay Bolts are in place; will punch ¼ Inch Hole in ¼ Inch Iron; 5/16 and ⅜ Inch Hole in 3/16 Iron; and to the center of 30 Inch Sheets with Stay Bolts removed; complete, with Three Sets of Dies and Punches, Sizes ¼, 5/16 and ⅜ Inch. Weight Each, 250 Lbs.....$.....

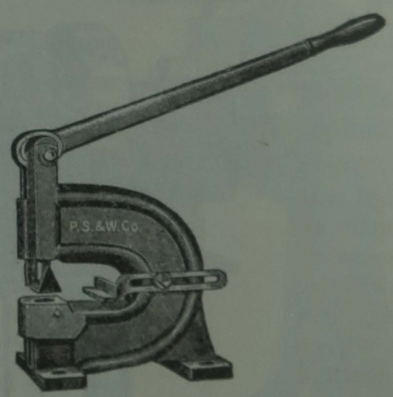


Fig. 1265

WITH ADJUSTABLE GAUGE

This machine is constructed to meet a wide field of usefulness and will prove an all-round punch for heavy work. The dies and punches as regularly made are intended for use on stock up to their full rated capacity but where clean punching in tin or light metal is desired a closer fitting die is preferable which can be furnished when so ordered at the price of the regular dies. It has a range for punching holes up to 1¼ inches in diameter. An extra stripper is necessary when punches from ½ to 1¼ inches are used. A stripper for 1¼ inch punch may be used with 1 inch punch and a stripper for ¾ inch punch may be used with ½ inch punch. Fitted with a gauge that is adjustable. **Each**

NO. 677—Will punch Iron, ⅜ Inches; size hole, ¼, 5/16 and ⅜ Inch; depth of Throat to Frame, 6 Inches; depth of Throat to Gauge, 5½ Inches; Weight Each, 220 Lbs.....$.....

All Above, One in a Box
Prices on Application

ANGLE AND TEE CUTTERS

OPEN THROAT—COMBINATION

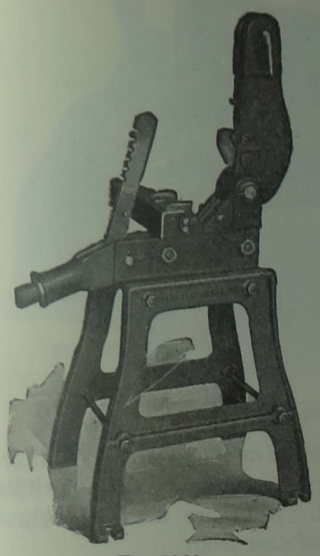


Fig. 1266

Open throat permits of entering the material from the front of the machine instead of inserting through the sides, as is usually the case with most machines. This feature reduces wear and tear on the knives, consequently prolonging their life, also making it possible to do the work in much less space than with machines where the material is run in from the side, over the knives. By the use of a pawl and ratchet a much greater leverage is obtained, thereby making it possible to punch and shear heavier stock with less effort than with the old style machines. Frame and Stand malleable iron. Cuts channel iron, can be furnished with or without Punch.

NOS.	1	2	3
Cuts Angles, Inches	1¾x1¾x3/16	2½x2½x¼	3x3 x⅜
Cuts Tees, Inches	1¼x1¼x3/16	1¾x1¾x3/16	2¼x2¼x¼
Cuts Flat, Inches	1¼x⅜	1¾x½	2½x9/16
Punches Hole, Inches	½x3/16	½x5/16	⅝x⅜
Weight Each, Lbs	118	216	448
Each, with one Set Knives	$30.00	40.00	90.00
Extra for Punch	$ 5.00	6.00	7.50

Note—Same knives can be used for angles, flats and channels. Tees only requiring special knives.

STEEL SHEARS

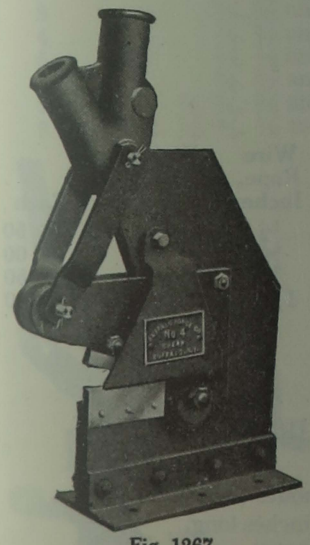


Fig. 1267

The frame consists of heavy armor-plate brand of steel with a tensile strength seven times greater than that of cast iron. Gives maximum cutting capacity, absolute insurance against breakage, and lightest weight.

The leverage is powerfully compounded, and a stripper on side prevents binding. A strong, indestructible tool which will give long, efficient service.

Made for bench as shown in cut; or furnished with cast iron stand.

	Bench Type		Cast Iron Stand	
NOS.	3	3C	4	4C
Cuts Flat up to, Inches	3x½	3x½	3x⅝	3x⅝
Cuts Round up to, Inches	¾	¾	1	1
Weight Each, Lbs	100	145	250	250
Each	$50.00	55.00	70.00	75.00

SLITTING SHEARS

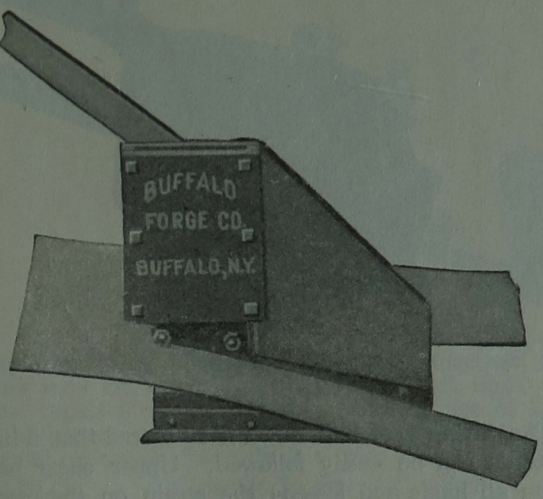


Fig. 1268

Frames are made of armor-plate brand of steel; tough, strong and unbreakable, but of lightest weight. Will shear any width, has angle steel base with bolt holes on both sides. The leverage is strong, easy and correctly compounded, knives of crucible steel.

Also furnished on cast iron stand.

	Bench Type	Mounted on Cast Iron Stand
NOS.	20	20C
Cuts Sheets up to, Inches thick	⅛	⅛
Cuts Flats up to, Inches	2½x⅛	2½x⅛
Weight Each, Lbs	35	70
Each	$40.00	44.00

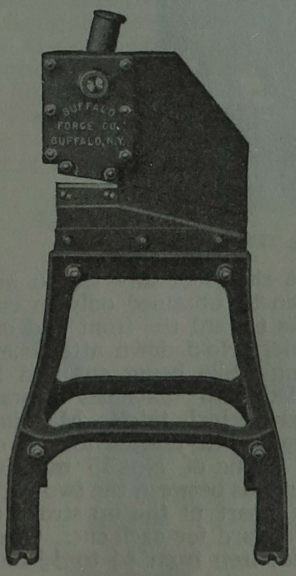


Fig. 1269

Design is very simple and very powerful. The knife plunger is operated by an eccentric, working on the principle of a power punch. The offset in the frame prevents binding, and guides the sheet accurately along a straight line. A sheet of any width may be cut. All working parts are carefully machined drop forgings and accurately fitted. The knives are of crucible steel and warranted to cut the metal absolutely straight and clean.

The tensile strength of the Armor-Plate steel used in the frame is 75,000 lbs.—over seven times greater than cast iron. Occupies very small space, is easily moved around, and will not crack or break under heavy stress or in cold weather, like cast iron.

NOS.	21	22
Shears Plate, Inches	3/16	¼
Cuts Flat Bars, Inches	2½x¼	2½x5/16
Weight Each, Lbs	75	115
Each	$60.00	80.00

SLITTING SHEARS

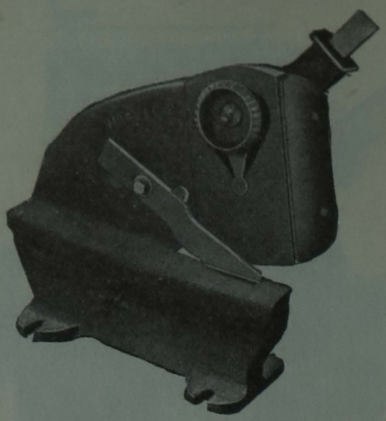


Fig. 1270

The Stripper or hold-down is so placed that a line on material can be easily followed. Upper shear bearing is on an angle and lessens the strain on the machine. Swinging lever either way operates shears.

No. 2 is fitted with an attachment, fixed to the end of the eccentric, by which the throw of the eccentric can be changed from a long to a short throw for heavy work, or from a short to a long throw for light work, by the simple movement of a small steel pin in the attachment.

NOS.	Capacity, Inches	Length Blade, Inches	Weight Each, Lbs.	Each
1	1/8	4	55	$18.00
2	1/4	6	200	43.00

LEVER SHEARS

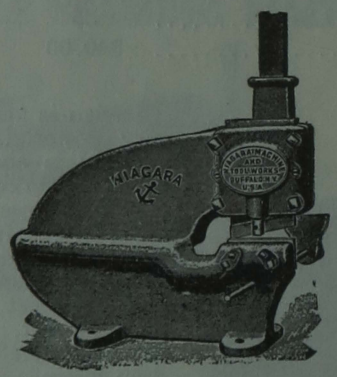


Fig. 1271

Suitable for cutting apart sheets of any length and width. Extreme capacity can be obtained only in cutting off strips. Lever works toward the front and one man can operate the machine. Hold down attachment prevents material from rising while being cut and an adjustable gauge is provided. All machines operate direct for iron not to exceed 1/4 inch thick. Machines Nos. 14 and 15 must be used with ratchet for use on iron 1/4 to 3/8 inch thick. Frame of No 15 machine carries a spring device that crowds between the two parts of the sheet and holds them apart at the up stroke to facilitate moving the sheet forward for each cut. Operated with compound lever for iron from 3/8 to 1/2 inch thick

NOS.	Capacity, Inches	Length Blade, Inches	Weight Each, Lbs.	Each	Legs Extra
13	1/4	4 1/2	300	$32.00	$5.00
14	3/8	5	480	46.00	5.00
15	1/2	6	800	85.00	10.00

LEVER SHEARS

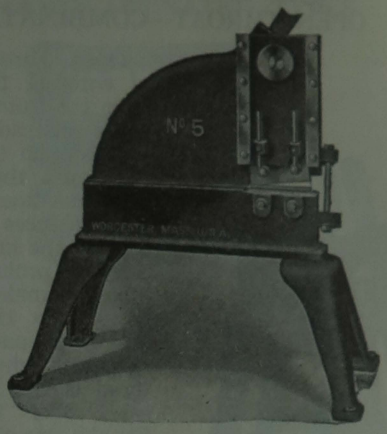


Fig. 1272

Powerful shears. Will cut flat or round iron. Arrangement of blades permits long cuts without burrs or riffles in the edges of the metal. Jaws are made of highest grade crucible steel, frame of cast iron.

NOS.	Capacity, Inches	Length Blade, Inches	Weight Each, Lbs.	Each
2	3/16	4	225	$60.00
3	1/4	5 1/2	380	90.00
4	5/16	7 1/2	585	125.00

Fig. 1273

Can be adapted for cutting flat or round iron or wire rope by merely changing the shear blades. Nos. 1 and 2 have cast iron frames; Nos. 3 and 4 have frames of cast steel.

NOS.	Capacity Flat Iron, Inches	Capacity Round Iron, Inches	Capacity Wire Rope, Inches	Weight Each, Lbs.	Each
1	1 3/4 x 1/8	7/16	1/2	30	$37.50
2	1 3/4 x 1/4	5/8	5/8	70	45.00
3	2 1/4 x 3/8	3/4	7/8	80	67.50
4	2 1/2 x 1/2	7/8	1 1/8	150	105.00

FOR SMALL ANGLE IRONS

Constructed of steel throughout. Lever furnished with the shear is 60 inches long. Will cut angles up to 1 1/2 x 1 1/2 x 1/4 inches or 1 3/4 x 1 3/4 x 3/16 inches

Each

NO. 4—Weight each, 150 lbs . . . $105.00

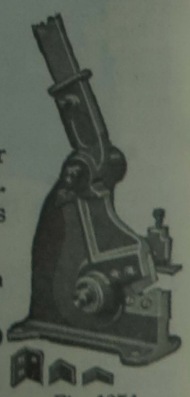


Fig. 1274

LEVER SHEARS

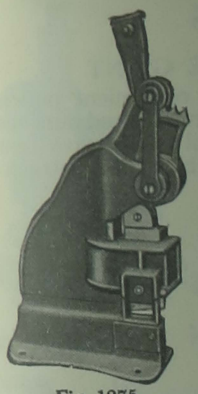


Fig. 1275

FOR PLATE IRON

Constructed of steel throughout. These shears have front working lever. There can be no bending or warping as all parts, plungers, links, etc., are firmly guided and evenly balanced.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
21	1/4	125	$135.00
22	5/16	142	172.00
23	3/8	186	195.00
24	7/16	250	263.00

FOR SQUARE IRON

The bars to be sheared are passed through the square openings in casting. Sides will not be burred or flattened in cutting off. Constructed of steel throughout and all machined and fitted with utmost accuracy.

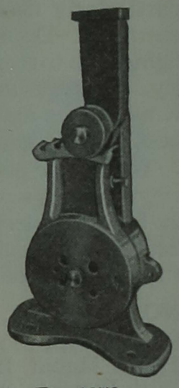


Fig. 1276

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
2	5/16 and 1/4	21	$37.50
3	3/8, 5/16 and 1/4	26	37.50
4	1/2, 3/8 and 5/16	42	52.50
5	5/8, 1/2 and 3/8	94	68.00
6	3/4, 5/8 and 1/2	135	97.00
7	7/8, 3/4, 5/8 and 1/2	225	127.00
8	1, 7/8, 3/4, 5/8 and 1/2	284	172.00

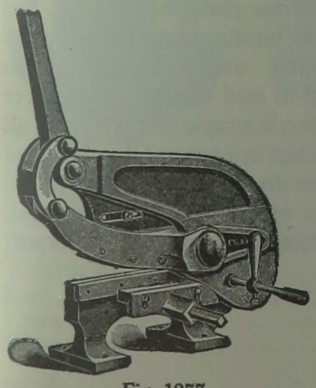


Fig. 1277

FOR PLATE AND ROD

For cutting apart sheets of any length and width, as well as bars. A hold down prevents sheets from rising while being cut. Inserted dies for cutting rods are of tool steel and hardened.

NOS.	1	2	3
Length Knives, Inches	10	10	10
Cut Plate Up To, Inches	1/8	3/16	1/4
Cut Flat Iron Up To, Inches	1/4x3	5/16x4	3/8x3
Cut Round Iron Up To, Inches	1/2	5/8	3/4
Weight Each, Lbs.	165	220	350
Each	$38.00	42.00	52.00
Iron Legs, Extra	5.00	5.00	5.00

ROD CUTTERS

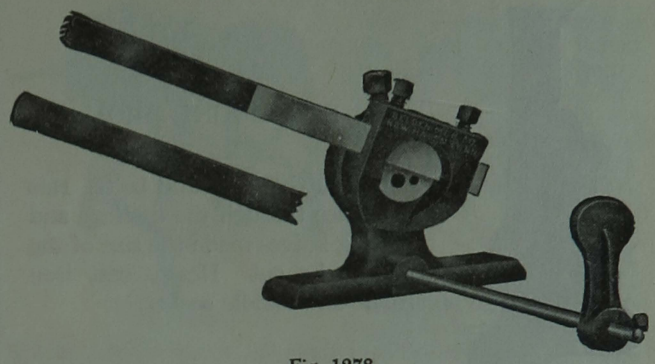


Fig. 1278

Simple and very powerful. With the gauge set, the operator may cut rapidly and uniformly stock up to the greatest capacity of the machine. Cutters are of high grade tool steel, cannot spread apart and may be easily sharpened. Frames are malleable iron.

NOS.	Capacity, Inches	Each
1	5/8	$15.00
2	3/8	8.25

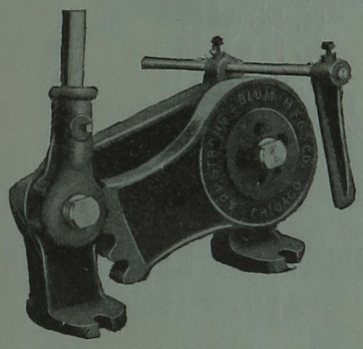


Fig. 1279

MARVEL

Cutting dies have round openings of correct size to cut off rods and wire within the capacity of the machine, leaving ends round and true. Cutter is so arranged as to bring the lever at a convenient height from the bench, and the gearing is so placed as to remove all danger of crushing the operator's hand. The round steel lever can be instantly removed when desired.

The center of leverage is low, relieving the strain on the bolts and the bench; gauge facilitates cutting a number of pieces of the same length.

NOS.	Capacity, Inches	Weight Each, Lbs.	Each
5	3/8	12	$7.00
6	5/8	35	13.00
7	7/8	95	25.00

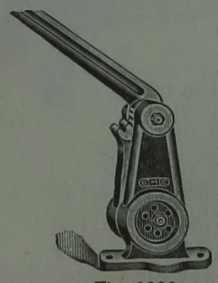


Fig. 1280

B. M.

Cuts iron, steel, brass and copper rods with one clean, sharp stroke, leaving the severed ends round and smooth in perfect condition for threading without first filing or otherwise dressing them.

NOS.	Cuts Rods, Inches	Weight Each, Lbs.	Each
1	1/8, 3/16, 1/4, 5/16, 3/8	10	$7.00
2	3/8, 7/16, 1/2, 9/16, 5/8	45	16.00

One in a Box

ROD CUTTER

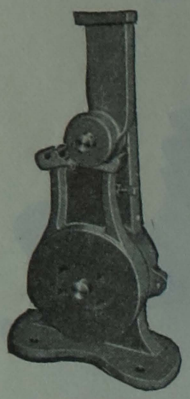


Fig. 1281

FOR ROUND IRON

For cutting rods and bolts. Has the holes through the castings and cutting knives made the size of the bar to be cut. Heavy cast iron frame and handle socket.

NOS.	Capacity, Inches	Weight Each, Pounds	Each
1	5/16, 1/4 and 3/16	15	$30.00
2	3/8, 5/16 and 1/4	21	37.50
3	1/2, 3/8 and 5/16	26	37.50
4	5/8, 1/2 and 3/8	42	52.00
5	3/4, 5/8 and 1/2	94	68.00
6	7/8, 3/4, 5/8 and 1/2	135	107.00
7	1, 7/8, 3/4, 5/8 and 1/2	225	127.00
8	1 1/8, 1, 7/8, 3/4, 5/8 and 1/2	284	172.00

COMBINATION LEVER PUNCHES AND SHEARS

A most dependable tool which will make clean, accurate cuts to its full capacity; the strippers are adjustable to prevent binding of the stock when the cutter leaves the work; a twin socket lever, operating both punch and shears, is worked from one side; its powerful leverage makes operation easy on all work. Frame is of armor-plate steel, punches and shears of high grade crucible steel.

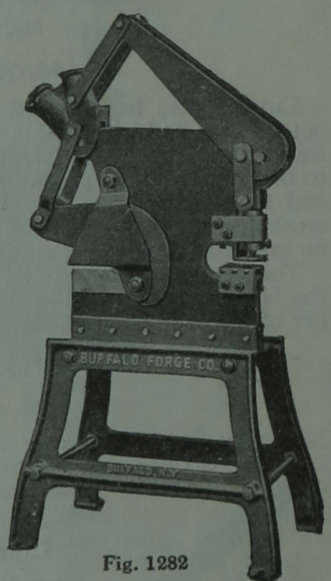


Fig. 1282

NOS.	2B	3B	4B
Punches, Inches	1/4x1/4	3/8x3/8	1/2x1/2
Cuts Rounds, Inches	5/8	3/4	1
Cut Flats, Inches	2x5/16	3x1/2	3x5/8
Punches Furnished, Inches	1/8, 3/16 & 1/4	1/4, 5/16 & 3/8	1/4, 3/8 & 1/2
Depth Throat, Inches	3 3/4	4	5 1/4
Weight Each, Lbs.	123	215	400
Each	$50.00	70.00	100.00

COMBINATION LEVER PUNCHES AND SHEARS

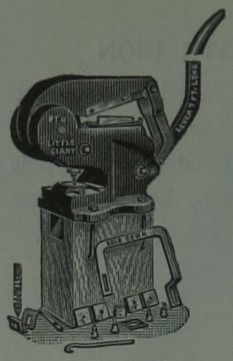


Fig. 1283

LITTLE GIANT

Powerful and convenient punch and shears. Shears, dies and punches made of best tool steel; heavy cast iron frame; has hold down attachment.

NOS.	1	2	3
Cuts Flats Inches	5/8x2 1/2	1/2x4	3/8x4
Punches, Inches	5/16 to 5/8	5/16 to 5/8	1/4 to 1/2
Wgt. Each, Lbs.	525	350	280
Each	$62.50	50.00	37.50

LEVER PUNCHES

Easy to operate, lever type being particularly desirable for one man operation. Do accurate work from lightest up to their maximum capacity. Frames are of Armor-plate. Knives, dies and punches made of best quality crucible steel.

The armor-plate frame with its extraordinary strength and elasticity is best adapted to meet sudden, heavy and irregular strains to which this class of tools is subjected.

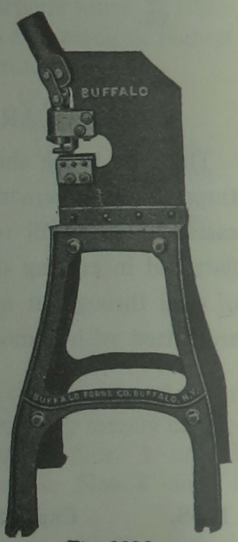


Fig. 1284

NOS.	13	14
Punches, In.	1/4x1/4	3/8x3/8
Depth Throat, In.	4	4 1/4
With Punches, In.	1/8 & 1/4	5/16 & 3/8
Weight Each, Lbs.	80	110
Each	$40.00	50.00

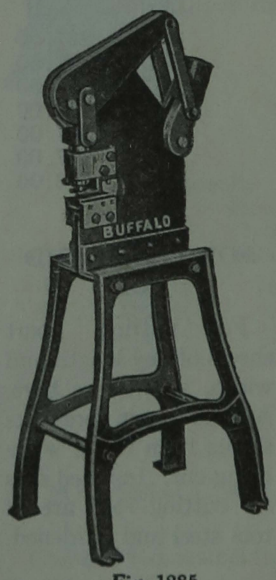


Fig. 1285

COMPOUND LEVER

Armor-plate steel frame, has great tensile strength, absolutely reliable under sudden strains and in cold weather; back lever action is simple and powerful, all fittings are accurately machined from drop forgings; punches and dies are of best crucible steel, carefully ground and tempered.

NOS.	13B	14B	15B
Capacity up to, Inches	1/4x1/4	3/8x3/8	1/2x1/2
Depth of Throat, Inches	4	4 1/2	5 1/4
Size Punches, Inches	1/8 & 1/4	5/16 & 3/8	1/4, 3/8 & 1/2
Weight Each, Lbs.	100	125	260
Each	$40.00	50.00	70.00

LEVER PUNCHES

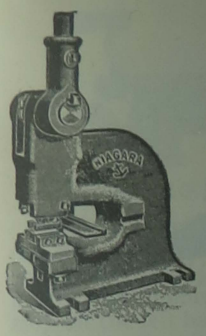


Fig. 1286

Lever works both ways, front or back. Capacity: ¼ inch hole through ¼ inch iron or equivalent; 3/16 and ¼ inch holes can be punched in angle iron, if the center of the hole is not less than ½ inch from the inner corner.

NOS.	11	12
Size Throat, Ins.	4	6
Weight Each, Lbs.	110	115
Each	$13.50	15.00

NOS.	13	14	16	18
Size Throat, Inches	10	15	25	36
Weight Each, Lbs.	135	190	390	550
Each	$17.50	20.00	32.00	40.00

Lever works both ways. Without ratchet: ½ inch hole through 3/8 inch iron; ¼ and 3/8 inch holes can be punched in angle iron. Adjustable back gauge to regulate distance from holes to the edge of sheet furnished.

NOS.	21	22	23
Size Throat, Inches	4	6	10
Weight Each, Lbs.	175	240	375
Each	$22.00	25.00	30.00

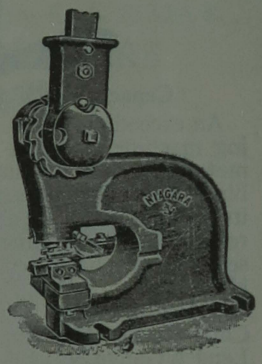


Fig. 1287

NOS.	24	26	28
Size Throat, Inches	15	25	36
Weight Each, Lbs.	530	950	1675
Each	$40.00	60.00	92.00

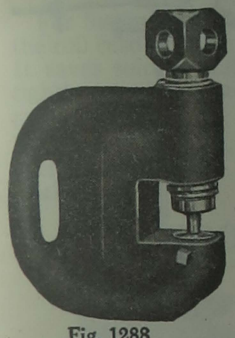


Fig. 1288

SCREW PUNCHES

BOILER MAKERS'

Bodies of these punches are made of the highest grade of steel castings, having a tensile strength of 80,000 lbs. All parts are carefully machined and fitted.

NOS.	A	B	C
Punches Holes, Inch	5/16	½	½
Thickness Iron, Inch	¼	¼	5/16
Distance from Edge of Sheet, Inches	1½	1½	1½
Weight, Each, Lbs.	13	17	25
Each, Complete	$20.00	24.00	30.00
Extra Punches, Each	$1.75	1.75	2.00
Extra Dies, Each	$1.75	1.75	2.00

NOS.	D	E	F	G
Punches Holes, Inch	¾	¾	¾	¾
Thickness Iron, Inch	½	¾	¾	¾
Distance from Edge of Sheet, Inches	2	2½	3½	4
Weight, Each, Lbs.	41	64	78	92
Each, Complete	$40.00	60.00	75.00	80.00
Extra Punches, Each	$2.00	2.50	2.50	2.50
Extra Dies, Each	$2.00	2.50	2.50	2.50

BAR BENDING TOOLS

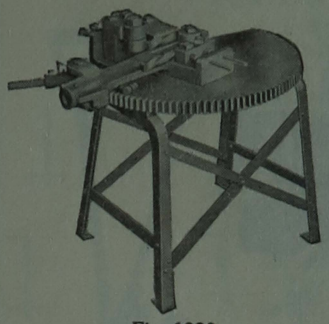


Fig. 1289

For bending reinforcement bars or for heavy manufacturing. Capacity for cold bending: Flat, ¾x2 inches; round, 1½ inches; square, 1¼ inches; square twisted, 1¼ inches. Capacity for hot bending: Flat, 1x2 inches; round, 1¾ inches; square, 1½ inches; square twisted, 1½ inches. Machine can also be arranged for bending channels, T iron, angle iron, etc., at slight additional expense.

	Each
NO. 6—Right Hand, Weight Each, 695 Lbs.	$180.00
NO. 7—Left Hand, Weight Each, 695 Lbs.	180.00

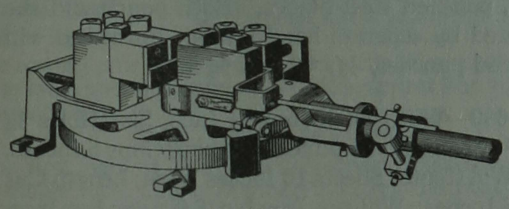


Fig. 1290

"U" BENDERS

Suitable for bending round, square, flat or square twisted bars into U shape or any angle up to 180 degrees with a radius at point of bending to correspond to size of forming pin. U bends cannot exceed 8 inches over all, including stock; inside distance between legs of U determines size of forming pin; forming dies can be easily changed from one size to another; rectangular bends can be made by substituting rectangular front die for the round forming pin and bends up to 120 degrees can be made, stock as light as ¼x1 inch can be bent around to 145 degrees without heating by using a special forming block; one round and one rectangular die furnished with each machine.

NO. 1

For cold bending: flat ¼x2 inches, round 5/8 inch, square ½ inch, square twisted ½ inch or equivalent.

For hot bending: flat ½x2 inches, round 7/8 inch, square ¾ inch, square twisted, ¾ inch, or equivalent.

	Each
Weight, 90 lbs	$50.00

NO. 2

For cold bending: flat 3/8x3 inches, round 1 inch, square 7/8 inch, square twisted, ¾ inch, or equivalent.

For hot bending: flat 5/8x3 inches, round 1¾ inches, square 1½ inches, square twisted, 1½ inches, or equivalent.

	Each
Weight, 250 Lbs.	$95.00

EXTRA ROUND FORMING DIES

2 inches and under	$3.00
Over 2 inches and up to 4 inches	4.00
Over 4 inches and up to 6 inches	5.00
Over 6 inches and up to 7¾ inches	6.00

Note.—When it is desired to bend flat stock of a greater width than the maximum specified for these machines we can arrange special dies to order.

EXTRA DIES

Set of edge bending dies with clamping plate	$25.00
Angle iron die suitable for bending angle iron after a "V" shaped piece has been cut out of one leg of angle	6.00
Angle iron die with plate suitable for bending angle iron without cutting "V" shaped piece out of one leg	25.00

SHEARS AND PUNCHES

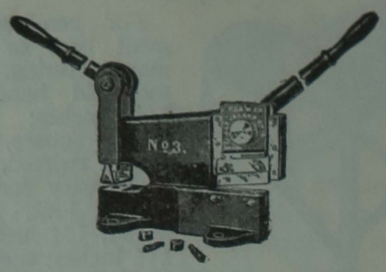


Fig. 1291

EXTRA HEAVY TYPE

Designed for heavy shearing and punching work. Have great strength, making them exceptionally useful machines for general shop work. Japanned gray iron body, polished steel blades. Both punch and shears are operated by separate hand levers. Furnished with three dies and punches, ¼, 5/16 and ⅜ inch.

Each

NO. 680—Will Punch Iron ⅜ Inch, Size Holes ¼ 5/16, ⅜ Inch; Depth of Punching Gaps 5 Inches. Will Center Sheets 10 Inches Wide; Length Cut 6 Inches; Will cut Iron No. 8 Gauge; Bar Iron, ¼x1½ Inches, ⅜x¾ Inch and ½ Inch Square. Weight Each, 400 Lbs.....$.....

Regularly Crated; Extra Charge for Boxing

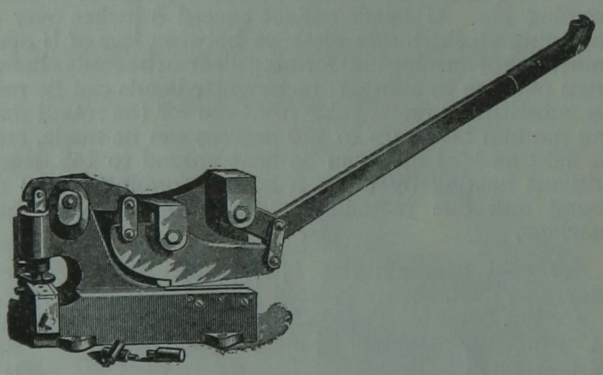


Fig. 1292

Japanned gray iron body; polished steel blades; length of handle, 29 inches.

No. 678 furnished with one combination die and four punches; viz., ⅛, 3/16, ¼ and 5/16 inch.

No. 679 furnished with one combination die and five punches; viz. ⅛ 3/16, ¼, 5/16 and ⅜ inch.

Each

NO. 678—Cuts 4¼ Inches; Will Punch to Center of a Circle 5¼ Inches in Diameter; Cuts Iron up to ⅛ Inch Thick; and Narrow Bars 3/16 and ¼ Inch; Will Punch ⅛ Inch Iron up to 2⅝ Inch from Edge; Weight Each About 100 Lbs....$.....

NO. 679—Cuts 4¾ Inches; Will Punch to Center of a Circle, 5½ Inches Diameter; Cuts Iron up to ⅛ Inch Thick, and Narrow Bars 3/16 and ¼ Inch; Will Punch 3/16 Inch Iron up to 2¾ Inch from Edge; Weight Each about 120 Lbs.....$.....

One in a Box

Prices on Application

NOTCHING MACHINES

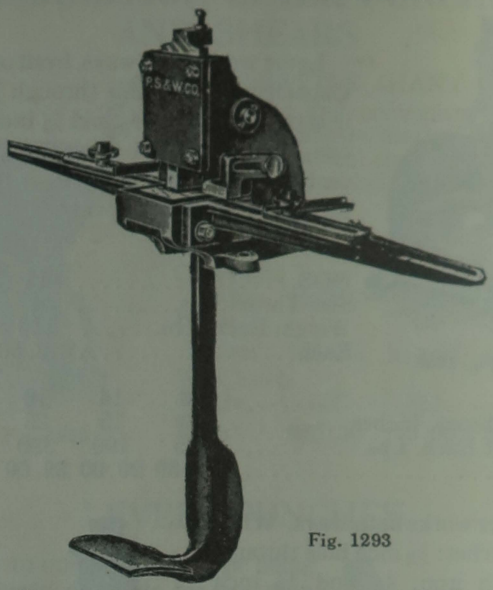


Fig. 1293

Capacity—No. 20 Gauge Iron and Lighter

An exceedingly well constructed, pendulum lever notching machine intended for notching blanks of pieced sheet metal ware for cutting the corners of square pans and hinge notches of boxes and similar work. Dies are made in sections so that they may be easily sharpened and reset. Dies and punch are made from Jessop tool steel scientifically hardened and tempered.

NO.	737
Size Regular Dies, Inches	1x2
Capacity for Receiving Special Dies up to, Inches	2x2
Length Gauge Supporting Arms, Inches	19
Weight Each, Lbs.	175
Each	$...

One in a Box

WIRE REELS

For holding coils of wire convenient to wiring machines.

So made that it can be used in a vertical or horizontal position.

The arms can be made of any length desired. As made they are of sufficient length to receive ordinary coils of wire, and can be easily adjusted to receive smaller coils.

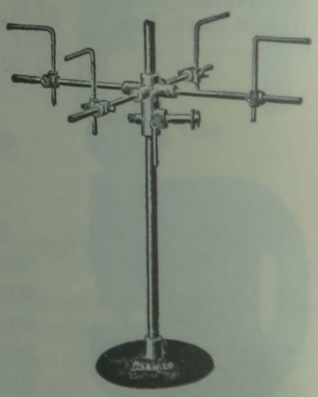


Fig. 1294

Each

NO. 758—Weight Each, 50 Lbs...$....

WIRE CUTTERS

A simple and durable machine for wire cutting. It takes wire from coil and gauges and cuts it to the desired length. It cuts one quarter inch wire as well as all smaller sizes. A circular attachment graduated in inches and fractions with adjustable gauge provided.

Each

NO. 490—Capacity ¼ inch; Weight Each, 50 Lbs..... $....

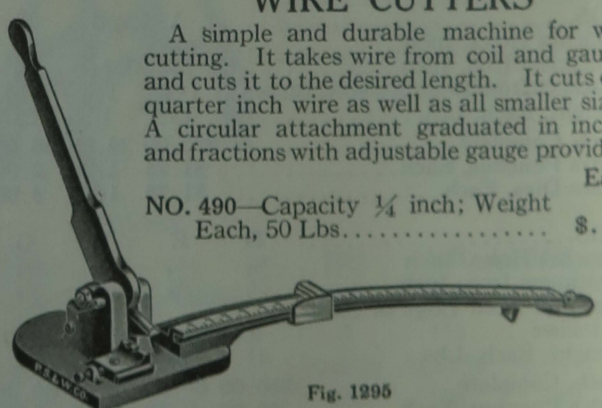


Fig. 1295

One in a Box **Prices on Application**

GUTTER MACHINES

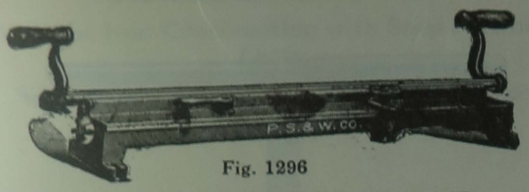


Fig. 1296

ADJUSTABLE GUTTER BEADER

Used for forming a bead on the edge of gutter. So constructed that it can be easily adjusted to be used with rods from ⅜ to ⅞ inch in diameter. The thickness of the metal is determined by the size of the rod. It has a gauge or stop on the left hand end, so that after adjusting the jaws and setting the gauge for the size of the rod to be used, the jaws can be easily opened to remove the work and rod, and then closed to exactly the same position as when the bead was formed so that the operator can form any number of beads of exactly the same size. The jaws are adjusted by a hand wheel with rack and pinion which adjusts both ends of the movable jaw.

	Each
NO. 700—Length, 31 Inches; Weight Each, 75 Lbs.	$....

CROSS LOCK SEAMERS

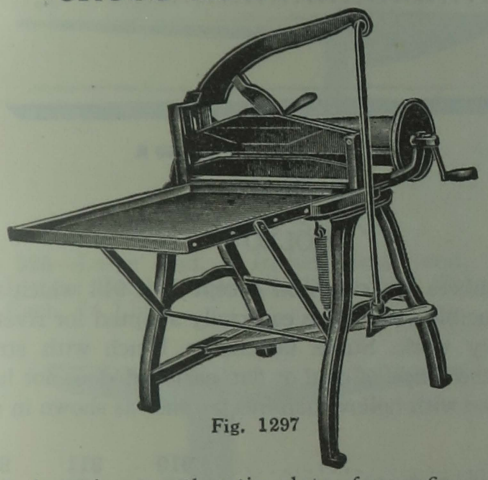


Fig. 1297

For fastening together tin plates for roofing and forms the roll ready to lay on the roof. Does not deface the tin. It saves solder, makes smooth roofing, presses the lock tightly together so as to prevent slipping.

NOS.	740	741
For Roofing Plates, Size, Inches	20	28
Weight Each, Lbs.	332	395
Each	$....	.....

EAVE TROUGH END CLOSING FORMS

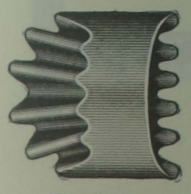


Fig. 1298

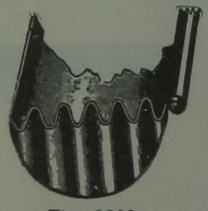


Fig. 1299

With the use of these eave trough end closing forms the ends of eave trough can be closed much neater and quicker. The form is placed in gutter and the iron is worked into grooves with a hammer producing a corrugated, closed end in any eave trough on which the forms are used.

A paper pattern showing how to cut end of trough and complete working instructions are packed with each form.

Size, Inches	3½	4	4½	5	6
Each	$...	...	...	...	...

Prices on Application

DOUBLE SEAMERS

FOR TIN ROOFING

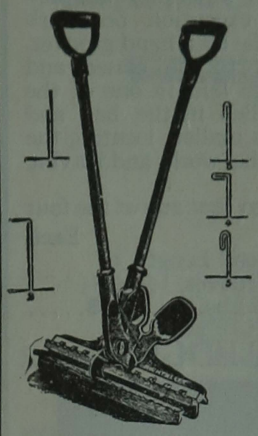


Fig. 1300

For standing lock and eaves will do the work more evenly than by any other process, and leave the formed lock of uniform height. Will work well over uneven roof boarding and will double seam hips and ridges with perfect ease.

The first pair of common-gauge seamers finish 1 inch seam, single lock, and is numbered 7 on the outside bar and 8 on the center bar.

The second pair of common-gauge seamers finishes ¾ inch seam, double lock, and is numbered 9 on the center bar and 10 on the outside bar.

The first pair of wide-gauge seamers finishes seam 1¼ inch, single lock, and is numbered 5 on the outside bar and 3 on the center bar.

The second pair wide-gauge seamers finishes seam 1 inch, double lock, and is numbered 4 on the center bar and 6 on the outside bar.

FOR IRON ROOFING

The first pair of iron roofing seamers finishes seam 1½ inch, single lock, and is numbered 22 on the outside bar and 23 on the center bar.

The second pair of Iron Roofing Seamers finishes seam 1 inch, double lock, and is numbered 20 on the outside bar and 21 on the center bar.

Nos. 742-742½ are fitted for I. C. Tin. No. 0742 is fitted for Iron Roofing not heavier than gauge No. 28 for single or double seam.

NOS.	742	742½	0742
Weight per set of Two Pairs, Lbs.	40	40	40
Per Set of Two Pairs	$....	.....	.....

ROOFING FOLDERS

Wood roofing folders are constructed with well seasoned wood with blades fitted of a high-grade, special steel, accurately machined and finely finished. Hinges and handles used are constructed throughout in a workmanshiplike manner.

C after number signifies common type and fitted for one size lock only. Imp. after number signifies improved pattern with adjustable gauge. No. 223 Imp. is a special folder adjustable for 20 or 30 inch sheets and is fitted with adjustable gauge.

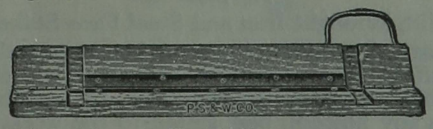


Fig. 1301

NOS.	3C	13C	23C	33C
Length, Inches	14	20	28	30
Will form Locks Size, Inches	5/16	5/16	5/16	5/16
Weight Each, Lbs.	8	9	11	14
Each	$...	....	....	....

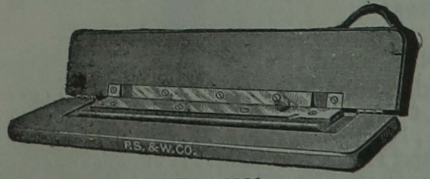


Fig. 1302

NOS.	113 Imp.	123 Imp.	223 Imp.
Length, Inches	20	30	30
Will form Locks Size, Inches	3/16-3/8	3/16-3/8	3/16-3/8
Weight Each, Lbs.	10	17	17
Each	$.....	.....	.....

Prices on Application

PIPE GROOVING STAKES

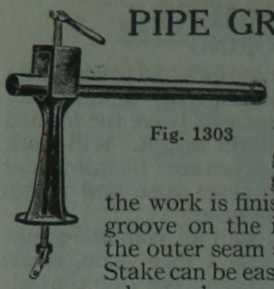


Fig. 1303

Stake is especially adapted for rapid execution on work usually done by a hand groover. The locks to be closed and grooved are laid in one of the grooves milled in the bar and the work is finished with a mallet, locating the groove on the inside of the work, and leaving the outer seam smooth.

Stake can be easily turned so that any of the four grooves can be used.

Each

NO. 924—Length of Stake, 35 Inches. Length of Grooves, 31½ Inches; Sizes of Grooves, ⅛-¼-⅜ and 7/16 Inches. Weight Each, 65 Lbs. ..... $.....

STEEL STRAIGHT EDGES

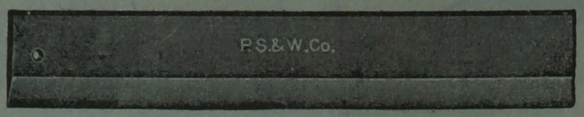


Fig. 1304

Made of steel and have beveled edges. Invaluable around the shop for laying out work in general.

NOS.	994	995
Length, Inches	48	96
Width, Inches	2¼x¼	2¼x¼
Weight Each, Lbs.	7½	15
Each ..... $	.....	.....

STAKE HOLDERS

UNIVERSAL

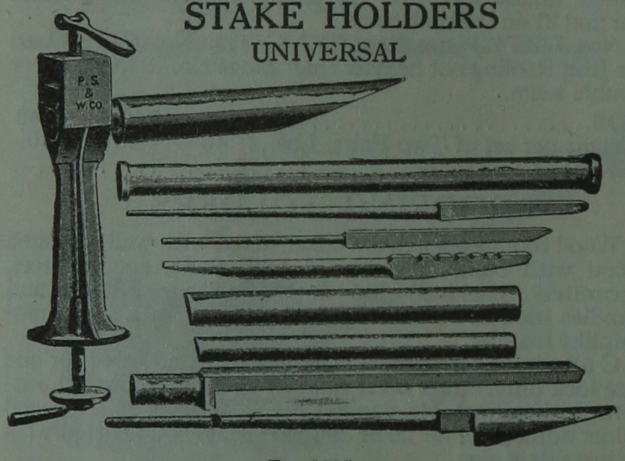


Fig. 1305

With Wrought Iron and Steel Face Stakes

The illustration above represents improved stake holder and the different tools capable of being used with it.

This holder enables the workman to use the stakes shown, in any position best suited to the work in hand, without mutilating the bench. One stake may be substituted for another with ease. Holders are convenient, solid, substantial and will give satisfaction.

When ordering these stakes other than in full sets, be careful to mention "For use in Universal Stake Holder," to avoid confusion with regular stakes. The set is made up as follows:

Names and Nos.	Weight Each, Lbs.
Stake Holder, only, No. 923	21
Beakhorn, two pieces, Nos.905 and 905½	47
Blowhorn , No. 926	10
Creasing and Horn, No. 929	8
Double Seaming, No. 9342	3
Conductor, two pieces, Nos. 933 and 933½	26
Candle Mould, No. 955	4½
Needle Case, No. 959	4

Per Set

NO. 964—Set Complete with Stake Holder; Weight per Set, 145 Lbs. ..... $.....

Prices on Application

MANDREL STAKES

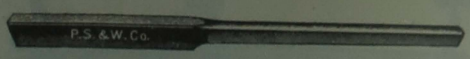


Fig. 1306

Stakes of cast iron with polished faces. No. 968 stakes have both round and flat surfaces, well adapting them to a variety of bench work. No. 967 solid are for receiving pipe of small diameter.

NO.	967	968
Length to Standard, Inches	30	.....
For Pipe as Small as Inches	2	.....
Width, Flat Part, Inches	....	2¾
Width Oval Part Tapers, Inches	....	2 5/16-2¾
Length Over All, Inches	....	43¾
Length, Flat Part, Inches	....	17¾
Length, Oval Part, Inches	....	26
Weight Each, Lbs.	34	47
Each ..... $	....	.....

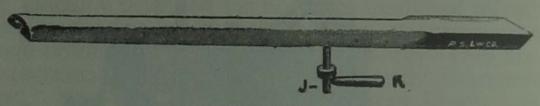


Fig. 1307

HOLLOW

All numbers are cast iron except No. 914 which is a forged crucible steel stake especially adapted for riveting and heavy work. Stake fastens to bench with straps made to the shape of oval or flat part and does not have a slat fitted with hollow mandrel fastener as shown in cut.

NOS.	910	911	914
Entire Length, Inches	40	60	44
Length Flat Part, Inches	9	12	9
Width, Flat Part, Inches	6	7	6
Length Oval Part, Inches	31	48	35
Radius of Circle, Inches	2	2½	2⅛
Weight Each, Lbs.	60	108	55
Each ..... $	..	...	...

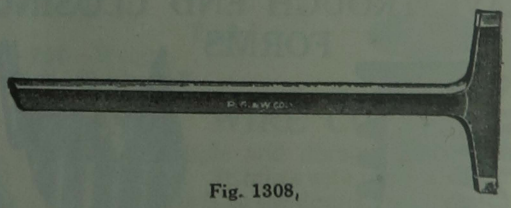


Fig. 1308,

SOLID

Cast Iron; Polished Faces

NOS.	960	960½	961	962
Size, Inches	3⅜	3	2¾	2¼
Length of Head, Inches	16	14¼	13	12⅜
Length of Standard, Inches	61	40	34½	30
Weight Each, Lbs.	128	86	56	43
Each ..... $	...	....	....	....

Packed as Ordered

Prices on Application

TINNERS' STAKES

Wrought Iron Construction with Steel Polished Faces

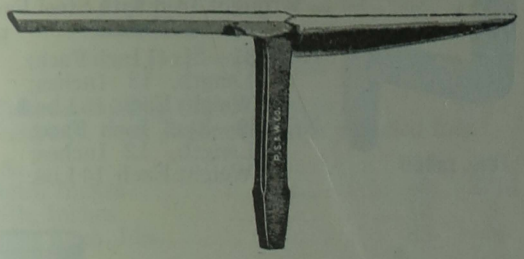


Fig. 1309

BEAKHORN STAKE

NOS.	901	902	904
Flat End, Inches	21½	20	19
Round End, Inches	16½	16½	14
Height Over All, Inches	19	17¾	15
Weight Each, Lbs.	46	37	27
Each	$....	....	....

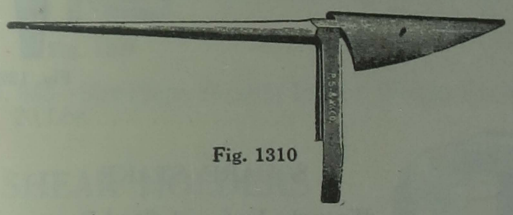


Fig. 1310

BLOWHORN STAKE **Each**

NO. 925—Large End, 9 Inches; Small end, 18 Inches; Height Over All, 11 Inches; Weight Each, 14 Lbs.....$.....

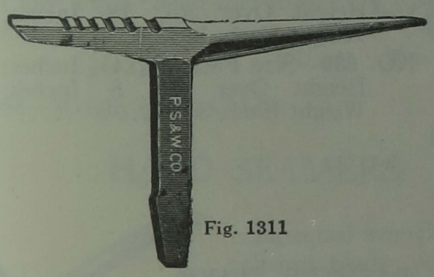


Fig. 1311

CREASING STAKE WITH HORN **Each**

NO. 927—Round End, 12 Inches Long; Flat End 6¾ Inches Long Length of Standard, 9½ inches; Weight Each, 12 Lbs.....$.....

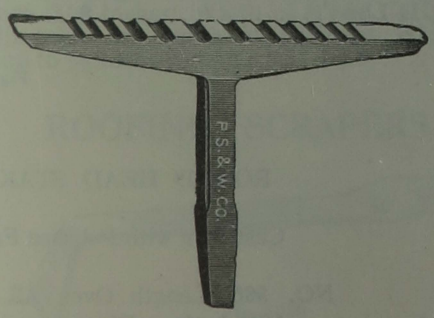


Fig. 1312

PLAIN CREASING STAKE **Each**

NO. 928—With 9½ Inch Standard; Length Top, 15x1½ Inches; Weight Each, 11½ Lbs.....$.....

Packed as Ordered
Prices on Application

TINNERS' STAKES

Wrought Iron Construction with Steel Polished Faces

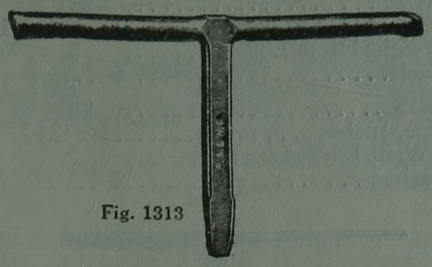


Fig. 1313

DOUBLE SEAMING STAKE **Each**

NO. 921—Large End, 17 Inches; Small End, 12 Inches; Height Over All, 17 Inches; Weight Each, about 37 Lbs.....$.....

NO. 922—Each End, 11 Inches; Height Over All, 17 Inches; Weight Each, 30 Lbs..... .....

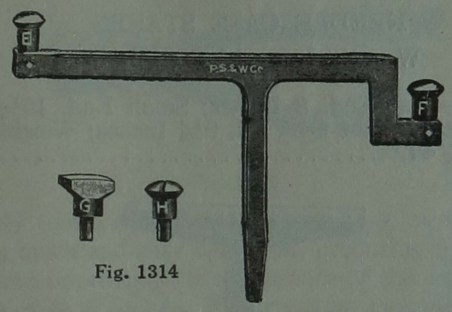


Fig. 1314

TEA KETTLE STAKE WITH FOUR STEEL HEADS **Each**

NO. 958—Length Over All, 32 Inches; Height Over All, 16 Inches; Diameter of Extra Round Heads E, 2 13/16; F, 2⅝; H, 2 9/16 Inches; size of Extra Square Heads G, 2¾x1¾ Inches; Weight Each, 75 Lbs.....$.....

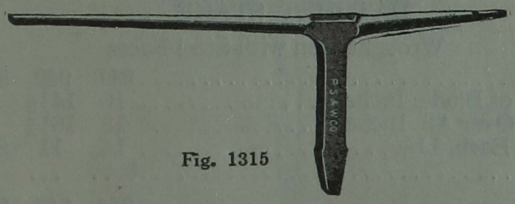


Fig. 1315

CANDLE MOULD STAKE **Each**

NO. 956—Small End, 9½ Inches; Large End, 18½ Inches; Height Over All, 10¼ Inches; Weight Each, 5 Lbs.....$.....

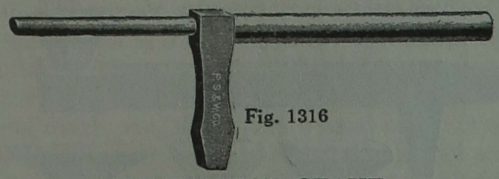


Fig. 1316

CONDUCTOR STAKE

Cast Iron with Polished Faces **Each**

NO. 971—Large End, 15 Inches; Small End, 11½ Inches; Height Over All, 11¼ Inches; Weight Each, 28 Lbs.....$.....

NO. 972—Large End, 14 Inches; Small End, 10½ Inches; Height Over All, 10 Inches; Weight Each 17 Lbs..... .....

NO. 930—Large End, 14 Inches; Small End, 14 Inches; Height, 10 Inches; Weight Each, 25 Lbs. .....

Packed as Ordered **Prices on Application**

TINNERS' STAKES

BOTTOM STAKES

Wrought Iron with Steel Face

Fig. 1317

NOS.	951	952
Size, Inches	1¾x13½	1½x13½
Weight Each, Lbs.	3	3
Each	$ ...	...
NOS.	953	954
Size, Inches	1⅛x13½	1x13½
Weight Each, Lbs.	2	3
Each	$ ...	...

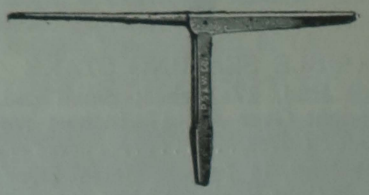


Fig. 1318

NEEDLE CASE STAKES

Wrought Iron with Steel Faces

Each

NO. 957—Flat End, 8 Inches; Small End, 10½ Inches; Height Over All, 9½ Inches; Weight Each, 4 Lbs. ..... $.....

Fig. 1319

HATCHET STAKE

Wrought Iron with Steel Faces

NOS.	941	942	943
Length of Blade, Inches	16	14½	13
Height Over All, Inches	18	16½	15
Weight Each, Lbs.	14	11	8½
Each	$...	...	...
NOS.	944	945	946
Length of Blade, Inches	11	9	7
Height Over All, Inches	14	11	10
Weight Each, Lbs.	6½	5	5
Each	$...	...	...

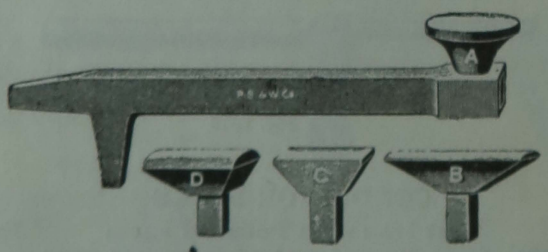


Fig. 1320

DOUBLE SEAMING STAKE

With four assorted heads; solid cast iron with polished surfaces.

Each

NO. 949—Length Over All, 29½ Inches; Height Over All, 10¾ Inches; Weight Each, 110 Lbs. .$.....

Prices on Application

TINNERS' STAKES

Fig. 1321

BEVEL EDGE SQUARE STAKE

Wrought Iron with Steel Face

Each

NO. 931—2¾x4½ Inch Face; Length, 13 Inches; Weight Each, 16 Lbs. $.....

NO. 932—3½x5 Inch Face; Length, 12 Inches; Weight Each, 14 Lbs. .....

COPPERSMITH'S SQUARE STAKE

Wrought Iron with Steel Faces

Each

NO. 935—Length of Standard, 15 Inches; Face 1¾x2½ Inches; Weight Each, 11 Lbs. ..... $.....

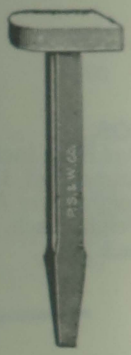


Fig. 1322

SQUARE STAKE

Wrought Iron with Steel Faces

Fig. 1323

Each

NO. 936—Size of Face, 3x5 Inches; Height Over All, 16 Inches; Weight Each, 11 Lbs. ..... $.....

NO. 938—Size Face, 2½x4½ Inches; Height Over All, 18 Inches; Weight Each, 14 Lbs. ....

NO. 939—Size Face, 2¾x4½ Inches; Height Over All, 8 Inches; Weight Each, 3 Lbs. ....

BATHTUB STAKE

Cast Iron with Polished Face

Each

NO. 966—Length Over All, 16 Inches; Width Across Top, 3 Inches; Weight Each, 11 Lbs. ..... $.....

Fig. 1324

Fig. 1325

ROUND HEAD STAKE

Cast Iron with Polished Face

Each

NO. 965—Length Over All, 12½ Inches; Diameter of Head 3 Inches; Weight Each, 9½ Lbs. ..... $.....

Prices on Application

BENCH PLATES

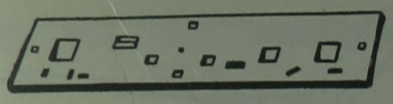


Fig. 1326

Used for holding tinners, stakes.
Solid cast iron; Japanned, with polished face.

NOS.	980	981	982
Length, Inches	48	37½	30
Width, Inches	12	8	8
Weight Each, Lbs.	85	46	31
Each	$...	....	....

REVOLVING BENCH PLATES

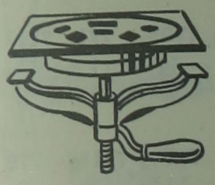


Fig. 1327

This plate is inserted into a work bench, to hold stakes, shears, etc., in position convenient to workman. Solid cast iron; Japanned.

Each

NO. 983—Size Plate, 8¾x8¾ Inches; Weight Each, 20 Lbs. ..... $.....

SHEAR HOLDERS

STOW'S IMPROVED

Fastens to bench like standards. Shears can be held in any position and at any angle. Solid cast iron; Japanned.

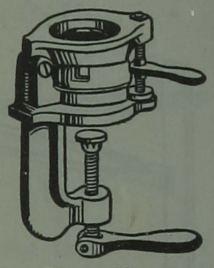


Fig. 1328

Each

NO. 985—Weight Each, 17 Lbs. ..... $.....

HAND SEAMERS

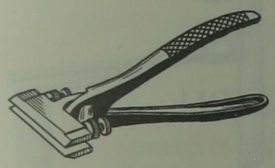


Fig. 1329

Japanned wrought iron body; polished blade; adjustable for seams of different widths and it is light to carry in pocket.

Each

NO. 791—Length Over All, 7¼ Inches; Length of Blade, 3½ Inches; Width of Blade, ⅞ Inch; Adjustable for Seams of Different Widths, 5/16 up to ⅞ Inch; Weight Each, 1 Lb. ..... $.....

ROOFING SCRAPERS

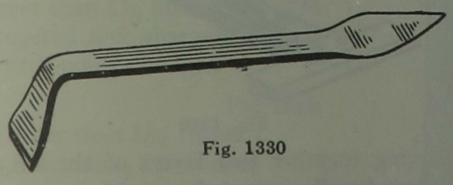


Fig. 1330

These Scrapers are forged from the highest grade of steel; are well tempered and finely finished.

Each

NO. 996—Size 3/16x5/8x10 Inches; Weight Each, 2 Lbs. ..... $.....

HAND PUNCHES

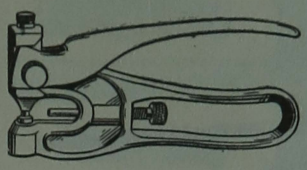


Fig. 1331

A practical and handy tool for outside work, light in weight; strong in construction and powerful in operation; the toggle movement on this practical tool works easily and rapidly; furnished with three sets of dies and punches. Sizes, ⅛, 3/16 and ¼ inch; capacity No. 20 gauge iron and lighter.

Each

NO. 790—Length, 7½ Inches; Height, 4 Inches; Depth of Throat, 1 Inch; Weight Each, 2½ Lbs. ..... $.....

HAND CRIMPERS

FOR SQUARE PIPE

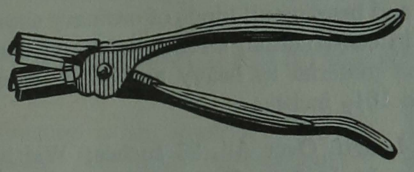


Fig. 1332

Handy tool for making the assembling of square pipe joints a quick and easy operation, producing tight-fitting joints and improving the appearance of the work, and is light to carry in pocket. Wrought iron, Japanned.

Each

NO. 787—Length, 11 Inches; Weight Each, 2 Lbs. .. $.....

HAND REAMERS

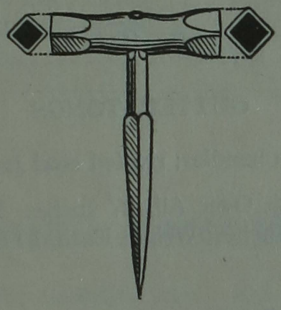


Fig. 1333

A combination tool of great value to the worker in sheet metal. The reamer is forged from a high-grade steel properly hardened and tempered, drawn to a sharp, hard point for pricking through light material and reaming holes to ordinary size required for fitting dampers in pipe and for general rough punching where a hand punch is not available. It will prove a handy and desirable tool around the shop and on jobs outside of the shop for enlarging holes already punched, using the handle of the reamer as a useful socket wrench.

The handle is of malleable iron made up in a socket wrench with ½ inch and ⅝ inch square hole.

Per Dozen

NO. 792—Length reamer, 5¾ Inches; Length Handle, 4 Inches; Length Tool Over All, 7 Inches; Weight per Dozen, 6 Lbs. ..... $.....

Prices on Application

ROOFING TONGS

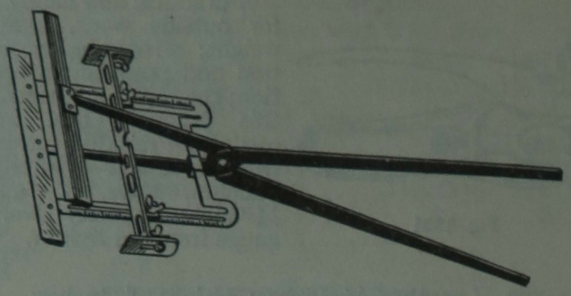


Fig. 1334

PATENT ADJUSTABLE

With adjustable and removable gauge. These tongs will turn any edge to 10 inches, by adjusting the thumb screw on sliding gauge to the desired position; are adapted to edging and bending all kinds of ordinary sheet metal.

Simple in construction, strong, light and durable; can be used on material as heavy as No. 22 gauge. Turn edge ½ to 10½ inches.

Each

NO. 775—Length Over All, 36 Inches; Width of Clamp, 14 Inches; Depth Jaws, 11 Inches; Weight Each, 14 Lbs.....$....

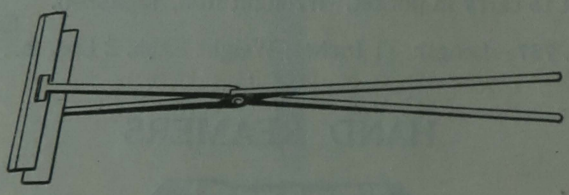


Fig. 1335

GUTTER TONGS

Malleable iron handles; riveted steel jaws.

Each

NO. 777—Length Over All, 37 Inches; Width of Jaws, 12½ Inches; Weight Each, 10 Lbs.....$.....

Fig. 1336

SQUEEZING TONGS

Used on roll and cap roofing and on pressed standing seam roofing.

Each

NO. 766—Length Handle, 24 inches; Size of Clamp, 11½ Inches; Weight per Pair, 17 Lbs.....$....

Prices on Application

ROOFING TONGS

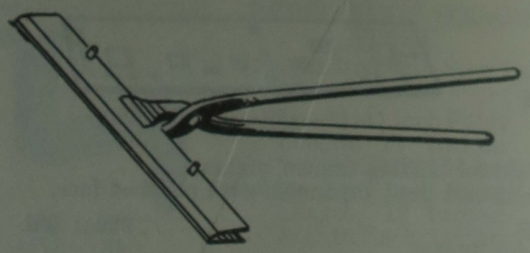


Fig. 1337

REGULAR

Japanned malleable iron, with steel clamps; length over all, 24 inches; width of clamp, 18½ inches. These tongs are used on the roof for drawing together the two layers of tin before cleating.

NOS.	770½	770¾	771	771¼
Will Turn One Size Lock, Inches	½	¾	1	1¼
Weight Each, Lbs.	8	8	8	9
Each ..... $				

NOS.	771½	771¾	772
Will Turn One Size Lock, Inches	1½	1¾	2
Weight Each, Lbs.	9½	10	10½
Each ..... $			

ADJUSTABLE

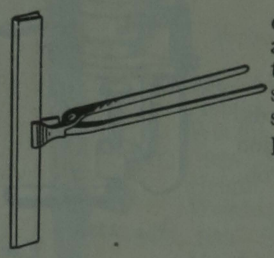


Fig. 1338

Japanned malleable iron handles; steel clamps; these clamps are adjustable; a single pair will turn five different widths of seams; they are therefore sold in sets.

Each

NO. 773—Turn Seams ½, ¾, 1, 1¼, 1½ Inches; Length, 25½ Inches; Length Clamps, 18½ Inches; Weight Each, 9½ Lbs.....$....

Patent adjustable, hand riveted steel jaws. Japanned malleable iron handles.

Each

NO. 774—Turn Seams, ¾ to 3 Inches. Length, 25 Inches. Length Clamps, 18½ Inches; Weight Each, 9½ Lbs.$....

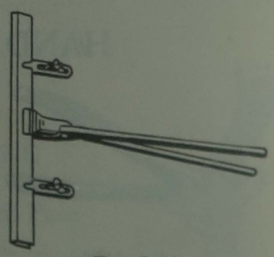


Fig. 1339

CLAMP TONGS

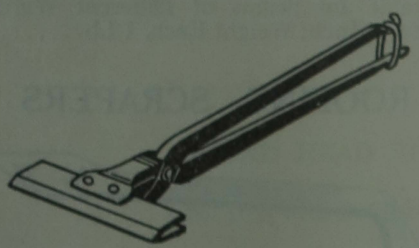


Fig. 1340

For drawing together two layers of tin for cleating. Malleable iron handles; riveted steel jaws.

Each

NO. 765—Length Over All, 16 Inches; Width of Jaws, 6 Inches; Weight Each, 3½ Lbs.....$.....

Prices on Application

SLATERS' TOOLS

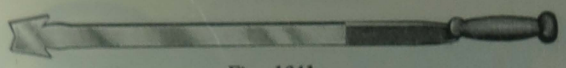


Fig. 1341

RIPPERS

Used by slaters for ripping out slate roofs. Blade is drawn down very thin from tool steel; handle forged.

Each

NO. 986—Length 24½ Inches; Weight Each 2⅞ Lbs. .....$.....

NO. 986½—Short to order.....

HAMMERS

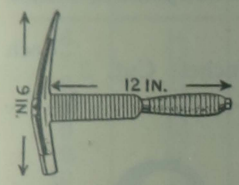


Fig. 1342

Forged from crucible cast steel with properly tempered head, point and cutting edges. Furnished with leather handle that will not break or wear out easily, smoothly finished to fit the hand snugly.

Each

NO. 987—Length Over All, 12 Inches; Length head, 9 Inches; Weight Each, 1¾ Lbs.....$.....

NO. 987½—Left Hand; Weight Each, 1⅜ Lbs.....

STAKES

Used for trimming slate. Forged from highest grade cast steel with polished tempered ends.

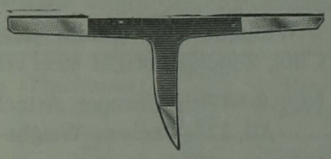


Fig. 1343

Each

NO. 988—Length Over All, 18 Inches; Weight Each, 2⅛ Lbs.....$.....

NO. 988½—Length Over All, 24 Inches; Weight Each, 3 Lbs.....

HOLLOW PUNCHES

Fig. 1344

Sizes up to 1¾ Inches; Forged steel, tempered and sharpened edges. Japanned shank; for cutting light metals.

Per Inch

All Sizes to and Including 1¾ Inch Diameter, Round.....$.....

Sizes larger than 1¾ inches, wrought shank; tempered and sharpened faces; Japanned with polished edges.

Per Inch

All Sizes Larger than 1¾ Inches up to and Including 3½ Inches, Round.....$.....

Fig. 1345

All Above Packed Loose

Prices on Application

RAISING HAMMERS

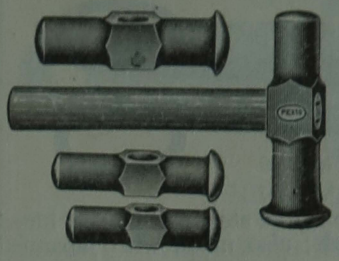


Fig. 1346

Steel forged with polished faces and plain hickory handles. Length over all, 12 Inches.

NOS.	1	2	3	4
Size Faces, Inches	2⅛x1¾	2x1½	1⅝x1⅜	1⅜x1⅛
Weight Each, Ozs.	82	60	36	28
Each.....$	.....	.....	.....	.....

PLANISHING HAMMERS

Finely finished with smooth, highly polished faces, free from indentations. Forged from a high-grade steel, well hardened. Furnished without handles.

Fig. 1347

NOS.	1	2	3
Size Face, Square End, Ins.	⅞	1	1⅛
Size Face, Round End, Ins.	⅞	1	1⅛
Weight Each, Lbs.	¾	1	1½
Each.....$	...	...	...

NOS.	4	5	6
Size Face, Square End, Inches	1¼	1⅜	1½
Size Face, Round End, Inches	1¼	1⅜	1½
Weight Each, Lbs.	2	2½	3
Each.....$	...	...	...

HAND GROOVERS

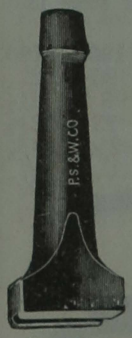


Fig. 1348

For tinsmiths use. Are forged from a special, tough, high-grade steel, scientifically hardened. Heads are highly polished.

NOS.	0000	000	00	0
Size Groove, Inches	19/32	17/32	7/16	3/8
Weight Each, Lbs.	1/10	1/10	1/6	1/6
Each.....$	....	....	....	....

NOS	1	2	3	4
Size Groove, Inches	11/32	5/16	9/32	7/32
Weight Each, Lbs.	1/6	1/6	7/8	7/8
Each.....$	....	....	....	....

NOS.	5	6	7	8
Size Groove, Inches	5/32	1/8	7/64	3/32
Weight Each, Lbs.	¾	¾	¾	¾
Each.....$	....	....	....	....

All Above, One in a Carton

Prices on Application

TINNERS' SNIPS

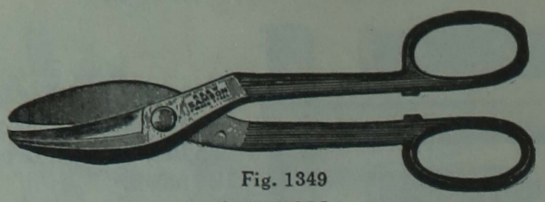


Fig. 1349

SAMSON

Forged from Norway iron; tool steel laid blades, blued handles and polished heads; also made with japanned finish handles.

Left-Hand Cut; Straight Pattern

NOS	46	47	48	49
Will Cut Iron, Nos	24	25	26	27
Length of Cut, Inches	4¼	4	3½	3⅛
Length Over All, Inches	15¾	14½	14	12¾
Weight Each, Lbs	3 9/16	3	2⅝	1⅞
Each	$...	....	....	....
NOS	50	51	52	53
Will Cut Iron, Nos	28	28	28	28
Length of Cut, Inches	2⅞	2¼	2	1¾
Length Over All, Inches	11¾	10½	8½	8
Weight Each, Lbs	1½	1⅛	⅝	½
Each	$...	....	....	....

Left-Hand Cut; Circular Pattern

NOS	C46	C47	C48	C49
Will Cut Iron, Nos	24	25	26	27
Length Cut, Inches	4½	4	3½	3
Length Over All, Inches	15¾	14½	14	12¾
Weight Each, Lbs	3 9/16	3	2⅝	1⅞
Each	$...	....	....	....
NOS	C50	C51	C52	C53
Will Cut Iron, Nos	28	28	28	28
Length Cut, Inches	2½	2¼	2	1¾
Length Over All, Inches	11	10½	8½	8
Weight Each, Lbs	1½	1⅛	⅝	½
Each	$...	....	....	....

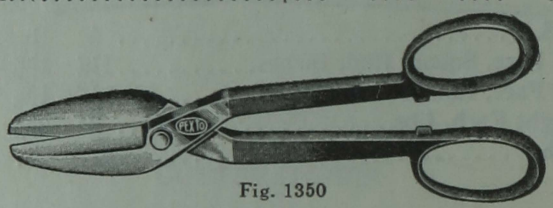


Fig. 1350

LYON

For Cutting Scrolls and Circles

Specially adapted to cornice and tin work; made so as to easily cut circles, scrolls, etc.; can also be used for regular work. Forged handles of Norway iron; tool steel laid blades; blued handles and polished heads.

NOS	170	180	190
Will Cut Iron, Nos	25	26	27
Length of Cut, Inches	3½	3	2½
Length Over All, Inches	14	13	12½
Weight Each, Lbs	2 1/16	2¼	1⅝
Each	$...	....	....

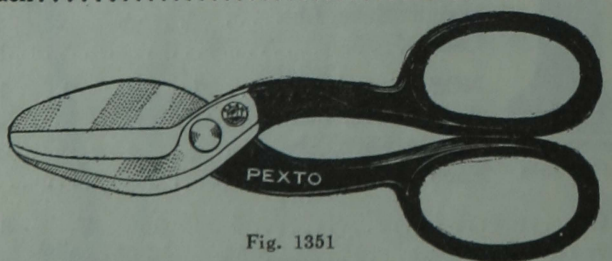


Fig. 1351

POCKET

Solid forged steel; polished blades; polished and blued handles.

Each

NO. 82—Length Over All, 7 Inches; Cut, 2 Inches; Weight Each, 1½ Lbs.....$.....

One in a Carton

TINNERS' SHEARS

Fig. 1352

HAND SLITTING SHEARS

Forged from best Norway iron and laid with highest-grade steel; Both handles remain above the work and the shears are so shaped that the cut sheets pass freely below the hand without danger of injury. Especially designed for cutting corrugated metal lengthwise; polished blades, Japanned handles.

Each

NO. 59—Length Over All, 13½ Inches; Cut, 3 Inches; Weight Each, 2½ Lbs.,.....$.....

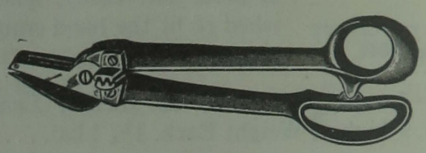


Fig. 1353

DOUBLE CUTTING SHEARS—WITH PIPE CRIMPER

Wrought iron handle japanned; bright steel blades. Cuts, 2 inches; bright steel crimper screwed to side.

NO. 2—With Crimper Attachment; Length Over All, 12¾ Inches; Weight Each, 3 Lbs.....$.....

NO. 02—Without Crimper Attachment; Length Over All, 12¾ Inches; Weight Each, 3 Lbs.....

NO. 22—Pocket Size, Without Crimper Attachment; Length Over All, 8½ Inches; Weight Each, 1 Lb..... .....

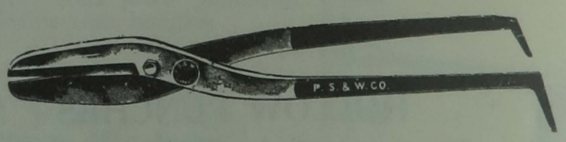


Fig. 1354

BENCH SHEARS

Black Japanned handles, forged from solid steel, polished; tool steel blades. Right hand cut; that is, the lower blade is on the right side.

NOS	0	2
Length of Cut, Inches	10½	8¾
Length Over All, Inches	42½	37
Will Cut Iron, Nos	18	19
Weight Each, Lbs	30	19
Each	$...	....
NOS	4	6
Length of Cut, Inches	7⅜	5¼
Length Over All, Inches	30	25
Will Cut Iron, Nos	20	22
Weight Each, Lbs	12	8¼
Each	$...	....

One in a Carton

HACK SAW BLADES
UNIVERSAL

Fig. 1355

These Blades are of the best grade of material and properly tempered to do the particular work for which they are intended. They cover all ranges of work from hand to high-speed power machines. The best results will be obtained by following the information given at the foot of this page in selecting a blade for any special purpose.

HAND

Length, Inches	Width, Inches	Gauge Nos.	Thickness Inches	Weight per Gross, Lbs.	Per Gross
6	½	23	.025	3	$7.00
7	½	23	.025	3½	7.50
8	½	23	.025	4	8.00
8	⅝	22	.028	6	9.00
9	½	23	.025	4½	9.00
9	⅝	22	.028	6½	9.60
10	½	23	.025	4¾	10.00
10	⅝	22	.028	7¾	10.20
11	½	23	.025	5¼	11.00
12	9/16	23	.025	7	12.00
12	9/16	22	.028	7¾	12.60
12	⅝	22	.028	8¾	12.60
14	9/16	22	.028	9	15.00

Note—The 22 Gauge Blades listed above will also be found economical for use in light weight power machines.

POWER

Length, Inches	Width, Inches	Gauge Nos.	Thickness Inches	Weight per Gross, Lbs.	Per Gross
10	¾	21	.032	9¾	$13.50
10	¾	18	.049	15¼	19.50
12	9/16	21	.032	8½	13.80
12	⅝	21	.032	9¾	14.40
12	¾	21	.032	11½	16.20
12	¾	18	.049	17¾	23.40
12	1	18	.049	24½	29.40
14	⅝	21	.032	10¾	16.80
14	¾	21	.032	12½	18.90
14	¾	18	.049	20	27.30
14	1	18	.049	28	34.30
14	1¼	18	.049	36	44.10
16	1	21	.032	22	30.40
16	1	18	.049	32	39.20
17	¾	21	.032	17	22.95
17	1	21	.032	22	32.30
17	¾	18	.049	26	33.15
17	1	18	.049	34	41.65
18	1	21	.032	25	34.20
18	1	18	.049	37	44.10
19	1	18	.049	39	46.55
20	1	18	.049	41	49.00
21	1	18	.049	43	51.45
23	1	18	.049	48	56.35
24	1	18	.049	47	58.80

Note.—14 and 17 Inch Blades 1 Inch wide and less are ½ Inch less to centers than length given.

The above Blades will be furnished with any of the following cuts at the same price.

Regular—14 or 16 Points per Inch, for cutting soft steel and iron solids and rails.

Medium—20 Points per Inch, for cutting brass castings, iron pipe and heavy tubing.

Fine—24 Points per Inch, for cutting brass rod, drill rod, brass pipe or medium tubing.

Tubing—32 Points per Inch, for thin tubing or thin sheet metal.

Medium cut will be sent unless otherwise specified.

HACK SAW BLADES
UNIVERSAL

Fig. 1356

HEAVY POWER

Length, Inches	Width, Inches	Gauge Nos.	Thickness Inches	Weight per Gross, Lbs.	Per Gross
14	1	16	.065	32½	$44.10
14	1¼	17	.056	42¾	53.90
15	1¼	17	.056	46½	57.75
16	1	16	.065	42½	50.40
16	1¼	17	.056	50	61.60
16	1½	16	.065	63	80.00
17	1	16	.065	44	53.55
17	1½	16	.065	64	85.00
18	1	16	.065	48	56.70
18	1¼	17	.056	53¼	65.45
18	1½	16	.065	72	90.00
19	1	16	.065	51	59.85
19	1½	16	.065	76½	95.00
20	1	16	.065	54	63.00
20	1¼	17	.056	60	77.00
20	1½	16	.065	81	100.00
21	1	16	.065	56	66.15
21	1¾	16	.065	98	126.00
22	1½	17	.056	87	100.10
22	1¾	16	.065	115½	132.00
23	1	16	.065	61	72.45
23	1¾	16	.065	116¾	138.00
24	1	16	.065	63	75.60
24	1½	17	.056	88¾	109.20
24	1¾	16	.065	118¼	144.00
26	1½	16	.065	.....	130.00
28	1½	16	.065	.....	140.00
30	1½	16	.065	.....	150.00
32	1½	16	.065	.....	160.00

UTILITY

The backs of these Blades are flexible but tough and the teeth are hardened and tempered.

HAND—23 Gauge

Length, Inches	**6**	**7**	**8**	**9**
Width, Inches	½	½	½	½
Weight per Gross, Lbs.	3	3½	4	4½
Per Gross	**$7.00**	**7.50**	**8.00**	**9.00**
Length, Inches	**10**	**11**	**12**	**13**
Width, Inches	½	½	9/16	½
Weight per Gross, Lbs.	4¾	5¼	7	7½
Per Gross	**$10.00**	**11.00**	**12.00**	**13.00**
Length, Inches		**14**	**15**	**16**
Width, Inches		½	½	½
Weight per Gross, Lbs.		7½	8	8½
Per Gross		**$14.00**	**15.00**	**16.00**

POWER—21 Gauge

Length, Inches		**12**	**12**	**13**
Width, Inches		⅝	¾	⅝
Weight per Gross, Lbs.		9¾	11½	10¾
Per Gross		**$14.40**	**16.20**	**15.60**
Length, Inches	**13½**	**13½**	**14**	**14**
Width, Inches	⅝	¾	⅝	¾
Weight per Gross, Lbs.	11¼	13½	10¾	12½
Per Gross	**$16.80**	**18.90**	**16.80**	**18.90**
Length, Inches	**16**	**16**	**16½**	**16½**
Width, Inches	⅝	¾	⅝	¾
Weight per Gross, Lbs.	14	15¼	14¼	15½
Per Gross	**$19.20**	**21.60**	**20.40**	**22.95**

HACK SAW BLADES

STAR

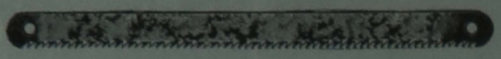


Fig. 1357

Star hack saw blades are made with hard or flexible backs. Only the highest grade tungsten steel prepared to special formula is used in the manufacture of these saw blades. They are finely tempered and hardened, have patent set and are perfectly toothed. The gullet of each tooth is milled in such a way as to provide a clearance for the chips.

HAND

Length, Inches	Width, Inches	Gauge Nos.	Thickness, Inches	Weight per Gross, Lbs.	Per Gross
6	7/16	24	.025	2¾	$7.00
7	7/16	24	.025	3	7.50
8	7/16	24	.025	3¼	8.00
9	7/16	24	.025	3½	9.00
10	½	24	.025	4⅝	10.00
11	½	24	.025	5	11.00
12	½	23	.025	5½	12.00
14	½	.....	.030	8¼	15.00

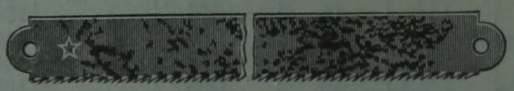


Fig. 1358

POWER

Made by the same methods as the hand saw blades in all standard lengths and gauges.

Length, Inches	Width, Inches	Gauge Nos.	Thickness, Inches	Weight per Gross, Lbs.	Per Gross
12	⅝	21	.032	10	$14.40
12	¾	21	.032	13	16.20
12	¾	18	.049	15¾	23.40
12	1	18	.049	25	29.40
14	¾	21	.032	14	18.90
14	¾	18	.049	18	27.30
14	1	18	.049	28	34.30
16	1	18	.049	34	39.20
17	1	18	.049	35	41.65
17	1	16	.065	45	53.55
18	1	18	.049	37½	44.10
21	1	18	.049	44	51.45
24	1	18	.049	48	58.80
24	1	16	.065	63	75.60

Blades for hand saws are made with 14 and 24 teeth to the inch. Use a saw with 24 teeth to the inch for cutting thin stock and tubing with thin walls. Blades with 14 teeth to the inch for general work will be supplied unless 24 teeth is specified on order.

HACK SAW FRAMES

STAR

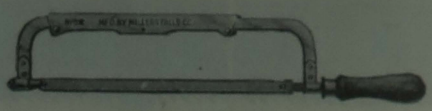


Fig. 1359

ADJUSTABLE TYPES

Frame of Crucible Steel, nickel plated and polished; extension sheath of steel on back by means of which adjustment is made. Will hold blades from 8 to 12 Inches; tropical wood handles.

Per Dozen

NO. 9—Depth under Back, 2¾ Inches; Weight per Dozen, 12½ Lbs. $17.00

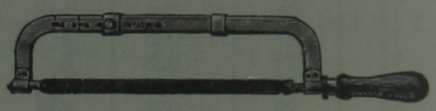


Fig. 1360

Frame nickel plated and polished. The adjustment is such as to give extra strength in the middle of the back. Blades may be faced in four directions and tightened by turning the handle; extends to hold blades from 8 to 12 Inches; tropical wood handle.

NOS.	10	11
Depth under Back, Inches	2⅜	3½
Weight per Dozen, Lbs.	15¾	16½
Per Dozen	**$19.00**	**20.00**

SOLID FRAME TYPES

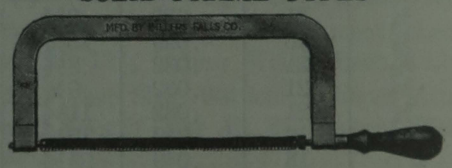


Fig. 1361

Heavy steel frame; 12 Inch blade; tropical wood handle.

Per Dozen

NO. 15—Depth under Back, 5¼ Inches; Weight per Dozen, 30 Lbs. $24.00

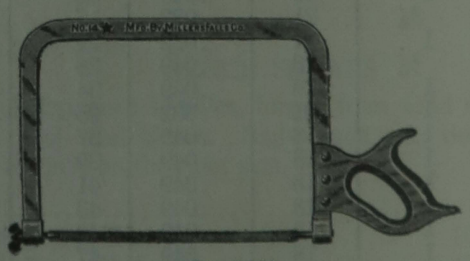


Fig. 1362

Frame of extra heavy steel stock 1x¼ Inch; for sawing rails and other large work. Blades may be faced in four directions; tightened by thumb screw and nut; Nos. 14 and 14½, nickel plated; No. 24, Japanned; Beechwood handle.

NOS.	14	14½	24
Blade Length, Inches	12	12	12
Depth under Back, Inches	10¼	7¼	10¼
Weight per Dozen, Lbs.	48	37¾	48
Per Dozen	**$35.00**	**32.00**	**22.50**

One-twelfth Dozen in a Pasteboard Box with One Blade

HACK SAW FRAMES

UNIVERSAL

Frames of crucible steel, finely finished; tightening posts and wing nut, case hardened steel; blades can be adjusted to face in four directions without removal from frame.

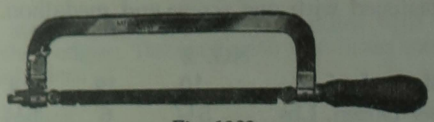


Fig. 1363

SOLID FRAME

With stained hardwood handles.

NO. 5

For Blades, Inches.....	8	9	10	12
Depth under Back, Inches	2¾	2¾	2¾	3⅛
Weight per Dozen, Lbs...	15	16	18	20
Per Dozen.....	**$10.20**	**10.80**	**11.40**	**12.00**

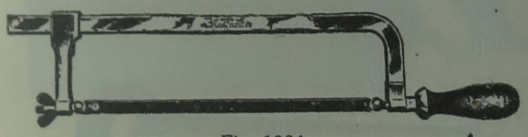


Fig. 1364

ADJUSTABLE

Solid back; frame extends to hold blades from 8 to 12 inches; locks solidly by means of a latch in a notch at each stop; stained hardwood handles.

Per Dozen

NO. 1908—Depth under Back, 3⅛ Inches; Weight per Dozen, 20 Lbs.....**$12.00**

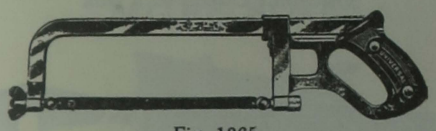


Fig. 1365

EASY GRIP—ADJUSTABLE

Solid back of 3/16x¾ inch steel; frame extends to hold blades from 8 to 12 inches; polished and nickel plated; easy grip handle, checkered; saw may be used to advantage as far as the arm can reach.

Per Dozen

NO. 12—Depth under Back, 3⅛ Inches; Weight per Dozen, 25 Lbs.....**$18.00**

STAR

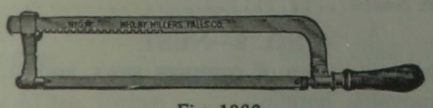


Fig. 1366

ADJUSTABLE

Frame of crucible steel; nickel plated and highly polished; handle of tropical wood. Will extend to hold blades from 6 to 12 inches; blades adjustable to face in four directions and tightened by turning handle.

Per Dozen

NO. 6—Depth under Blade, 2¾ Inches; Weight per Dozen, 18 Lbs.....**$19.00**

One-twelfth Dozen in a Pasteboard Box with One Blade

HACK SAW FRAMES

STARRETT

Frames have nickel plated and polished steel stock. Spring plungers overlap the ends of blade, automatically holding it to its home. Blades may be removed instantly by pushing plungers back slightly; saw may be set to any desired angle and given proper tension by turning nut in handle.

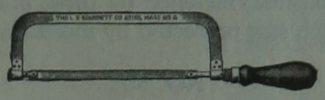


Fig. 1367

SOLID

Each

NO. 140—Solid Back; takes 8-Inch Blades; Weight Each, 1 Lb.....**$1.10**

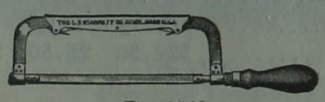


Fig. 1368

ADJUSTABLE

These frames have spring pawls which hold the frames securely to receive saw.

Each

NO. 145—Adjustable Back, for 8 to 10 Inch Blades; Weight Each, 1¼ Lbs.....**$1.50**

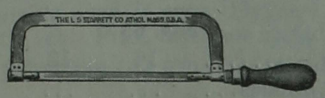


Fig. 1369

NO. 141—SOLID BACK

Frames are very stiff; stock is wider than commonly used; cannot be cramped by straining the blade; finished nickel plated and polished. Saw may be adjusted to four directions and tightened by turning the handle.

Blade Length, Inches.....	8	9	10	11	12
Weight Each, Lbs.....	1	1	1⅛	1⅜	1¼
Each.....**$0.85**	**.90**	**1.00**	**1.05**	**1.10**	

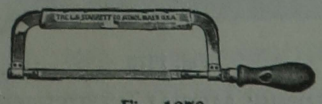


Fig. 1370

ADJUSTABLE

Each

NO. 146—Adjustable Back; takes 8 to 12 Inch Blades; Weight Each, 1⅓ Lbs.....**$1.20**

Each One in a Pasteboard Box with One Blade

HAND SAWS

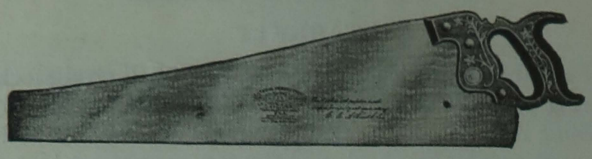


Fig. 1371

Silver steel blade; hardened and tempered; damaskeen finish; taper ground; skew back; ribbon edge. Applewood handle, perfection pattern, embossed; varnished all over and polished; fastened by three brass screws and medallion. Each saw protected by moisture-proof sack.

NO. 53

Length, Inches	16	18	20	22
Width at Butt	...	...	...	5⅞
Width at Point	...	...	...	2¼
Weight, Dozen	12¾	13¼	15¼	17¾
Per Dozen	**$16.75**	**18.50**	**20.50**	**22.50**
Length, Inches	**24**	**26**	**28**	**30**
Width at Butt	...	7	7⅜	...
Width at Point	...	2¾	2⅞	...
Weight, Dozen	19½	24¾	29¾	31
Per Dozen	**$24.50**	**25.50**	**28.75**	**32.50**

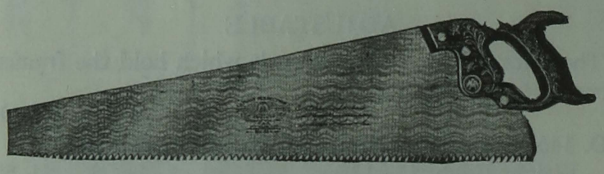


Fig. 1372

Similar to No. 53 except that it is made with a straight back. Each protected by moisture-proof sack.

NO. 65

Length, Inches	16	18	20	22
Width at Butt, Inches	...	...	...	5¾
Width at Point, Inches	...	...	...	2
Weight per Dozen, Lbs.	12½	14¼	16	19¾
Per Dozen	**$16.00**	**17.50**	**19.50**	**21.00**
Length, Inches	**24**	**26**	**28**	**30**
Width at Butt, Inches	...	7⅛	7½	...
Width at Point, Inches	...	2¾	2⅞	...
Weight per Dozen, Lbs.	22	26¾	29½	31¾
Per Dozen	**$23.00**	**24.50**	**28.75**	**32.50**

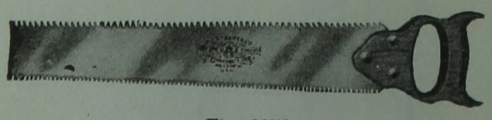


Fig. 1373

PLUMBERS' METAL CUTTING SAW

A useful saw for cutting flooring, pipe, metal, etc.; has teeth on both edges; beech handle.

Length, Inches	12	14	16	18
Weight per Dozen, Lbs.	...	...	...	...
Per Dozen	**$9.00**	**9.60**	**10.20**	**11.00**

COMPASS SAWS

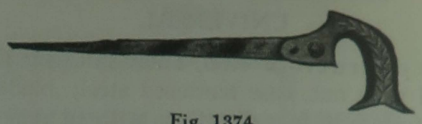


Fig. 1374

Silver steel blade; carved and polished; applewood handle; fastened with one screw and medallion.

NO. 2

Length Blade, Inches	10	12	14	16
Weight per Dozen, Lbs.	5¼	6	6½	7
Per Dozen	**$5.00**	**5.00**	**5.00**	**5.00**

One-half Dozen in a Box

NO. 3

Silver steel blade; carved and polished beechwood handle, fastened with saw screw and medallion. Made in 10, 12, 14 and 16 Inch lengths; same weight as No. 2.

Per Dozen **$5.00**

One-half Dozen in a Box

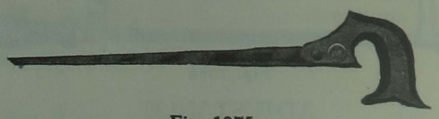


Fig. 1375

Silver steel blade; applewood handle; varnished and polished edges.

NO. 6

Length Blade, Inches	10	12
Weight per Dozen, Lbs	4¼	4½
Per Dozen	**$4.50**	**4.50**

One-half Dozen in a Box

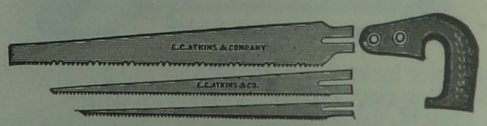


Fig. 1376

NESTED SAWS

Saw blades of silver steel, highly polished; quickly detachable handles.

NO. 1—NEST

Comprises keyhole, compass and pruning saw blade; adjustable handle.

Weight per Dozen Nests, Lbs. 11¾
Per Dozen Nests **$12.50**

NO. 2—NEST

Comprises two sizes of compass saws and a keyhole blade; removable handle.

Weight per Dozen Nests, Lbs. 10
Per Dozen Nests **$10.00**

NO. 3—NEST

Comprises compass and keyhole blade; metal cutting blade and detachable handle; adjustable to three angles.

Weight per Dozen Nests, Lbs. 14
Per Dozen Nests **$20.00**

One-quarter Dozen Nests in a Box

MITRE BOX SAWS

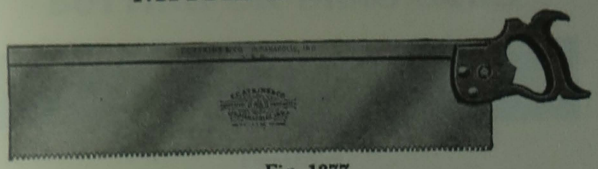


Fig. 1377

Silver steel blades, applewood handles with varnished and polished edges; fastened with two brass screws and a brass medallion.

Length, Inches	18	20
Weight 4 Inch, per Dozen, Lbs.	25½	28¾
Per Dozen 4 Inches, under Back	$25.25	27.50

Length, Inches	22	24	26
Weight 4 Inch, per Dozen, Lbs.	32¾	33¾	35
Per Dozen, 4 Inches under Back	$29.75	32.00	34.25
Weight 5 Inch, per Dozen, Lbs.	38	39½	40¼
Per Dozen, 5 Inches under Back	$32.00	35.00	38.00

One-third Dozen in a Box.

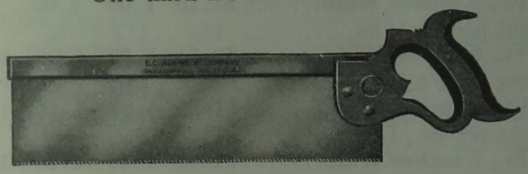


Fig. 1378

BACK SAWS

Silver steel blades; applewood handles with varnished and polished edges.

NO. 2

Length, Inches	8	10	12	14	16	18
Wgt. per Doz., Lbs.	10½	12	14	18¾	22½	25½
Per Dozen	$15.00	16.00	18.00	20.00	22.50	25.00

One-third Dozen in a Box.

MITRE BOXES

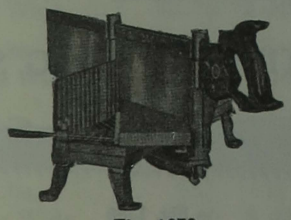


Fig. 1379

Iron castings, bronze enameled; bright parts nickeled; bottom boards sanded. Equipped with depth gauges; front post extensible for material of varying widths and gib, the casting directly beneath the saw, made to support the work to the end of the cut. Saw supports swing and clamp at any angle from 45° to 90° right or left.

NOS.	17	18	19	20
Size, No.	1	1	1	1
Saw, Inches	18x4	20x4	22x4	24x4
Cap, at Right Angle, Inches	6¾	6¾	6¾	6¾
Cap. at Mitre, Inches	4½	4½	4½	4½
Weight Each, Lbs.	14	14	14½	14½
Each, with Saws	$9.25	9.75	10.25	11.00
Each, without Saws	$7.50	7.50	7.50	7.50

NOS.	21	22	23	24	25
Size, No.	1	2	2	2	2½
Saw, Inches	26x4	22x4	24x4	26x4	28x5
Cap. at Rt. Agl., Inches	6¾	9⅜	9⅜	9⅜	9⅜
Cap. at Mitre, Inches	4½	6⅜	6⅜	6⅜	6⅜
Weight Each, Lbs.	15	15½	16	16½	18
Each, with Saws	$11.50	11.50	12.00	12.75	14.25
Each, without Saws	$7.50	8.50	8.50	8.50	10.25

ONE MAN CROSSCUT SAWS

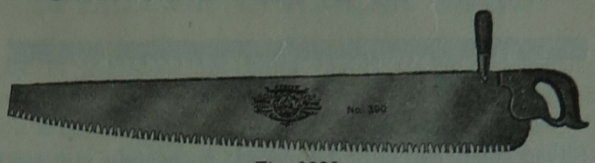


Fig. 1380

Tuttle Tooth

Special steel, evenly tempered; easy grip, beechwood handle, varnished on edges; handles will not work loose.

NO. 390

Length, Feet	2½	3	3½	4
Weight Each, Lbs.		2.42	2.87	3.51
Each	$1.40	1.68	1.96	2.24

Length, Feet	4½	5	5½	6
Weight Each, Lbs.	4.33	5.13	5.95	7
Each	$2.52	2.80	3.08	3.36

CROSSCUT SAWS

Fig. 1381

Common Tooth

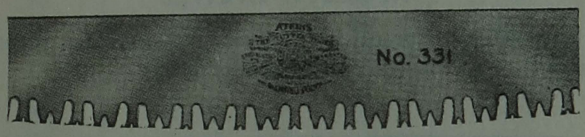


Fig. 1382

Tuttle Tooth

Furnished in silver or crucible Steel. Saws taper down evenly from ends toward the center and from the edge to the back, providing ample clearance and freedom from buckling; cutting edge of even thickness; operate easily, and with little set. Price does not include handles.

NOS. 337 and 330—14x16 Gauge

Length, Inches	4	4½	5	5½
Distance Pt. to Pt., Inch	⅝	⅝	⅝	¾
Weight Each, Lbs.	3.56	4.3	4.98	5.97
Each	$1.92	2.16	2.40	2.64

Length, Inches	6	6½	7	7½	8
Dist. Pt. to Pt., Inches	¾	1	1	1¼	1¼
Weight Each, Lbs.	6.34	7.65	8.42	9.88	10.73
Each	$2.88	3.12	3.36	3.60	3.84

CROSSCUT SAW HANDLES

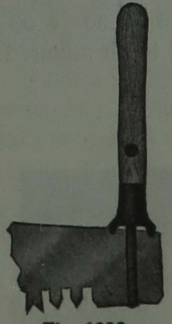


Fig. 1383

10 inches long; selected air-dried hardwood; heavy spot electric welded steel loop, three welds; malleable swivel washer and casting, Black Japanned.

Per Pair

NO. 3—Capacity, 3 to 4½ Inches; packed 50 Pairs in a Box; Weight, 92 Lbs. $0.35

FELLOE WEB SAWS

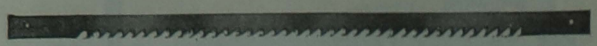


Fig. 1384

Silver steel; carefully tempered; accurately cut teeth; filed and set ready for use.

Length, Inches	6	7	8	10	12
Gauge	19	19	19	18	18
Width, Inches	3/16x1/2	3/16x1/2	3/16x1/2	3/16x1/2	1/4x1/2
Weight, Dozen, Lbs.	3/16	1/4	5/16	5/16	3/8
Per Dozen	$1.50	1.60	1.70	1.90	2.10

Length, Inches	14	16	18	20	22	24
Gauge	17	17	17	17	17	17
Width, Inches	1/4x3/4	1/4x5/8	1/4x5/8	1/4x3/4	1/4x3/4	1/4x7/8
Weight, Doz., Lbs.	7/16	1/2	1/2	5/8	3/4	7/8
Per Dozen	$2.40	2.75	3.10	3.45	3.85	4.25

Length, Inches	26	28	30	32	34	36
Gauge	17	17	16	16	16	16
Width, Inches	1/4x7/8	1/4x1	1/4x1	1/4x1	1/4x1	1/4x1
Weight, Doz., Lbs.	1	1 3/16	1 5/16	1 7/16	1 1/2	1 3/4
Per Dozen	$4.65	5.15	5.65	6.15	6.65	7.15

Saws not listed are special; with pin $0.50 per dozen additional list.

MULAY SAWS

Silver steel. Careful workmanship throughout; correct temper. Will withstand the hardest usage.

Fig. 1385

Width, Inches	10	11	12	14	16
Weight per Ft., Lbs.	6 1/4	6 7/8	7 1/2	8 5/8	10
Per Ft., 4 Gauge	$3.90	4.30	4.80	5.60	6.60
Weight per Ft., Lbs.	5 5/16	6 1/4	7	8 1/4	9 7/16
Per Ft., 5 Gauge	$3.60	4.00	4.40	5.20	6.20
Weight per Ft., Lbs.	5 3/4	6 3/8	7	8 1/4	9 7/16
Per Ft., 6 Gauge	$3.30	3.70	4.00	4.80	5.70
Weight per Ft., Lbs.	5 7/16	6	6 3/4	7 7/8	9 1/4
Per Ft., 7 Gauge	$3.00	3.30	3.60	4.40	5.20
Weight per Ft., Lbs.	5	5 1/4	6 5/16	7 1/2	8 3/4
Per Ft., 8 Gauge	$2.70	3.00	3.30	4.00	4.80
Weight per Ft., Lbs.	4 3/4	5 5/8	6 1/4	7 1/2	8 5/8
Per Ft., 9 Gauge	$2.40	2.70	3.00	3.60	4.40
Weight per Ft., Lbs.	4	4 5/8	6	7 1/4	8 1/2
Per Ft., 10 Gauge	$2.20	2.40	2.70	3.30	4.00

State length, width, gauge and style of tooth required.

MILL SAWS

Fig. 1386

Gauge Nos	4	5	6	7	8	9	10
Wgt. per Ft., Lbs.	5	4 1/2	4 1/4	3 3/4	3 1/2	3 1/4	3
Per Ft., 8 Ins. Wide	$3.30	3.00	2.70	2.40	2.20	2.00	1.80

State gauge, length, and point to point of teeth.

GANG SAWS

Fig. 1387

Silver steel; carefully ground and tempered. Accurately cut teeth, filed and set ready for use.

Gauge Nos	8	9	10	11	12
Weight per Ft., Lbs.	3	2 2/3	2 1/2	2 1/3	2
Per Ft., 8 Inches Wide	$2.00	1.90	1.80	1.70	1.60
Weight per Ft., Lbs.	00	00	00	00	00
Per Ft., 9 Inches Wide	$2.15	2.05	1.95	1.85	1.75
Weight per Ft., Lbs.	00	00	00	00	00
Per Ft., 10 Inches Wide	$2.50	2.35	2.10	2.00	1.90

Gauge Nos	13	14	15	16
Weight per Ft., Lbs.	1 1/16	1	5/6	2/3
Per Ft., 4 Inches Wide	$1.10	1.05	1.00	.95
Weight per Ft., Lbs.	1 1/4	1 1/8	5/6	5/6
Per Ft., 5 Inches Wide	$1.15	1.10	1.05	1.00
Weight per Ft., Lbs.	1 1/3	1 1/6	1	1
Per Ft., 6 Inches Wide	$1.25	1.20	1.15	1.10
Weight per Ft., Lbs.	1 2/3	1 1/2	1 1/3	1 1/6
Per Ft., 7 Inches Wide	$1.40	1.30	1.25	1.20
Weight per Ft., Lbs.	2	1 3/4	1 1/2	1 1/3
Per Ft., 8 Inches Wide	$1.50	1.40	1.35	1.30
Weight per Ft., Lbs.	2 1/8	2	1 3/4	1 1/2
Per Ft., 9 Inches Wide	$1.65	1.55	1.50	0.00
Weight per Ft., Lbs.	2 1/4	2 1/8	2	000
Per Ft., 10 Inches Wide	$1.80	1.70	1.60	0.00

If swaged add $0.05 per ft.; if fitted for use add $0.10 per ft. to list.

For gang saws with reversed teeth add 10 per cent. to list. State width, length, thickness by gauge, shape and space of teeth, number of teeth in saw, distance from lower end of saw to point of first tooth. All saws are fitted unless otherwise ordered.

BUTTING OR DRAG SAWS

Fig. 1388

Made in all styles and shapes of teeth to meet every requirement. Uniform temper and proper degree of hardness guaranteed. Will stand up to their work with the least cost for refitting. Tapered from butt to point.

MILL TOOTH

Width	6-In. Butt 4-In. Point	7-In. Butt 5-In. Point	8-In. Butt 6-In. Point
Weight per Ft., Lbs.	1	1 1/4	1 1/4
Per Ft., 10 Gauge	$1.05	1.15	1.25
Weight per Ft., Lbs.	7/8	1	1 1/8
Per Ft., 11 Gauge	$1.00	1.10	1.20
Weight per Ft., Lb.	3/4	7/8	1
Per Ft., 12 Gauge	$0.95	1.05	1.20
Weight per Ft., Lbs.	5/8	3/4	7/8
Per Ft., 13 Gauge	$0.95	1.05	1.20

Furnished filed and set. Wider or thicker than above figured by Mulay Drag and Mill Saw list, using the average width as the basis. If filed and fitted add $0.30 per ft. for 10 gauge and heavier, $0.15 per ft. for 11 gauge and thinner.

BUTTING OR DRAG SAWS

Fig. 1389

Silver steel; uniform temper and proper degree of hardness. Unusual attention given to grinding and smithing, thereby securing an even thickness on cutting edge.

LANCE TOOTH

Gauge Nos.	4	5	6
Weight per Ft., Lbs.	5	4½	4¼
Per Ft., 8 Inches Wide	$3.30	3.00	2.70
Weight per Ft., Lbs.	5⅝	5	5⅛
Per Ft., 9 Inches Wide	$3.60	3.30	3.00
Weight per Ft., Lbs.	6¼	5⅝	5¾
Per Ft., 10 Inches Wide	$3.90	3.60	3.30
Weight per Ft., Lbs.	6⅞	6¼	6⅜
Per Ft., 11 Inches Wide	$4.30	4.00	3.70
Weight per Ft., Lbs.	7½	7	7
Per Ft., 12 Inches Wide	$4.80	4.40	4.00
Weight per Ft., Lbs.	8⅝	8¼	8¼
Per Ft., 14 Inches Wide	$5.60	5.20	4.80
Weight per Ft., Lbs.	10	9½	9½
Per Ft., 16 Inches Wide	$6.60	6.20	5.70

Gauge Nos.	7	8	9	10
Weight per Ft., Lbs.	3¾	3½	3¼	3
Per Ft., 8 Inches Wide	$2.40	2.20	2.00	1.80
Weight per Ft., Lbs.	4⅞	4½	4⅛	3¼
Per Ft., 9 Inches Wide	$2.70	2.40	2.20	2.00
Weight per Ft., Lbs.	5½	5	4¾	4
Per Ft., 10 Inches Wide	$3.00	2.70	2.40	2.20
Weight per Ft., Lbs.	6	5¾	5⅝	4⅝
Per Ft., 11 Inches Wide	$3.30	3.00	2.70	2.40
Weight per Ft., Lbs.	6¾	6¼	6¼	6
Per Ft., 12 Inches Wide	$3.60	3.30	3.00	2.70
Weight per Ft., Lbs.	7⅞	7½	7½	7¼
Per Ft., 14 Inches Wide	$4.40	4.00	3.60	3.30
Weight per Ft., Lbs.	9¼	8¾	8⅝	8½
Per Ft., 16 Inches Wide	$5.20	4.80	4.40	4.00

Above prices are for Saws with Plain, Mill, Champion or Lance tooth. Special patterns of teeth take special prices. If saws are set and sharpened, add to list price $0.40 per ft. for 5 gauge and thicker, $0.30 per ft. for 6 to 10 gauge inclusive.

When ordering Mill, Mulay or Drag Saws, give length, width, thickness by gauge, style of teeth, space from point to point of teeth and distance from end of saw to point of first tooth. If to be drilled, send full size pattern showing position of holes.

Repairing Mill, Mulay and equal width Drag Saws.

Length	To 5 Ft.	Over 5 Ft.
Retoothing and Hammering	$1.50	2.00
Hammering only	$1.00	1.50

SPEED OF CIRCULAR SAWS

One of the most important points to be observed in connection with circular saws and which cannot receive too much attention is the speed at which saw operates. If the speed is too high, the saw cannot do good work and it becomes liable to many accidents. Too high speed generates heat and makes the saw touchy and limber. It will, then, only run and do good work on light feed, although the teeth may be in the best of order and have keen cutting points. As soon as the teeth are dull, the saw will run or dodge whenever it comes into contact with any unusual obstacles. Too low speed also has its objections, but it is not attended with such bad effects on the saw.

The following table will therefore be of assistance in determining the speed at which a circular saw should operate to give best results.

Table of Speed of Circular Saws

Size of Saw, Inches	Speed Rev. per Minute	Size of Saw, Inches	Speed Rev. per Minute
8	4,500	42	870
10	3,600	44	840
12	3,000	46	800
14	2,585	48	750
16	2,222	50	725
18	2,000	52	700
20	1,800	54	675
22	1,636	56	650
24	1,500	58	625
26	1,384	60	600
28	1,285	62	575
30	1,200	64	550
32	1,120	66	545
34	1,050	68	529
36	1,000	70	514
38	950	72	500
40	900	..	...

RULES FOR CALCULATING THE SPEED OF SAWS, PULLEYS OR DRUMS

Problem 1.—The diameter of the driven being given, to find its number of revolutions.

Rule—Multiply the diameter of the driver by its number of revolutions, and divide the product by the diameter of the driven; the quotient will be the number of revolutions of the driven.

Problem 2—The diameter and revolutions of the driver being given, to find the diameter of the driven, that shall make any given number of revolutions in the same time.

Rule—Multiply the diameter of the driver by its number of revolutions, and divide the product by the number of revolutions of the driven; the quotient will be its diameter.

Problem 3—To ascertain the size of the driver.

Rule—Multiply the diameter of the driven by the number of revolutions you wish it to make, and divide the product by the revolutions of the driver; the quotient will be the size of the driver.

SOLID TOOTH CIRCULAR SAWS.

Fig. 1390

Made of Silver Steel, a special high-grade, crucible steel.

This steel is manufactured in enormous quantities, which insures a greater uniformity than could possibly be otherwise obtained.

To avoid variation, it is chemically and physically analyzed and if not up to the standard is immediately rejected.

The heat treatment is based upon the analysis and the conditions under which the finished saw must operate.

The tempering is done scientifically, through the use of exclusive machinery which reduces the hardening and tempering processes to an absolute certainty.

The most improved machinery is used for grinding purposes. By its use, Silver Steel Saws are finished with great accuracy, giving any saw the required gauge, even when a variation of thickness is wanted at different points in the blade.

The hammering or smithing process is in the hands of skilled workmen.

Silver Steel files easily, but is exceedingly hard and tough. It is almost impossible to crack it, unless the saw is run at a disadvantage. It takes a perfect swage, and saws do not easily lose their teeth or points.

PATENT GROUND AND TEMPERED

Diameter, Inches	Thickness, Gauge	Size Hole, Inches	Weight Each, Lbs.	Each	Extra for Each Gauge Heavier	Beveling New Saws, Per Gauge	Net Extras for Setting and Sharpening if Rip	Net Extras for Setting and Sharpening if Cross Cut
4	19	3/4	1/4	$1.20	$0.03	$0.14	$0.06	$0.07
6	18	3/4	3/4	1.80	.05	.18	.07	.10
8	18	7/8	1	2.40	.08	.22	.10	.13
10	16	1	1 1/2	3.30	.12	.28	.12	.16
12	15	1	2 1/2	4.40	.20	.35	.15	.20
14	14	1 1/8	3 1/2	5.30	.25	.40	.18	.23
16	14	1 1/8	4 1/2	6.50	.30	.50	.20	.25
18	13	1 1/4	6	8.00	.40	.60	.23	.28
20	13	1 5/16	7	9.50	.50	.70	.25	.32
22	12	1 5/16	10	11.50	.60	.80	.28	.35
24	11	1 3/8	13	13.50	.70	.90	.31	.40
26	11	1 3/8	16	16.00	.85	1.05	.35	.45
28	10	1 1/2	21	18.50	1.00	1.20	.38	.50
30	10	1 1/2	24 1/2	21.00	1.15	1.30	.42	.55
32	10	1 5/8	27	24.00	1.30	1.40	.45	.60
34	9	1 5/8	33	27.00	1.50	1.55	.50	.65
36	9	1 5/8	40	31.00	1.80	1.70	.55	.70
38	9	1 5/8	49	35.00	2.00	1.85	.60	.75
40	9	2	100	41.00	2.30	2.00	.65	.80
42	8	2	105	47.00	2.60	2.20	.....	.85
44	8	2	115	55.00	3.00	2.40	.....	.90
46	8	2	125	65.00	3.50	2.60	.....	1.00
48	8	2	136	75.00	4.00	2.80	.....	1.10
50	7	2	148	85.00	4.50	3.00	.....	1.20
52	7	2	160	95.00	5.00	3.25	.....	1.30
54	7	2	170	105.00	6.00	3.50	.....	1.40
56	7	2	180	120.00	7.00	3.75	.....	1.50
58	7	2	195	135.00	8.00	4.05	.....	1.60
60	6	2	210	150.00	9.00	4.35	.....	1.70
62	6	2	225	170.00	10.00	4.65	.....	1.80
64	6	2	240	190.00	12.00	5.00	.....	1.90
66	6	2	265	210.00	15.00	5.35	.....	2.00
68	5	2	285	235.00	18.00	5.75	.....	2.10
70	5	2	295	265.00	21.00	6.15	.....	2.20
72	5	2	325	300.00	24.00	6.55	.....	2.30
74	5	2	335	340.00	27.00	7.00	.....	2.40
76	5	2	350	390.00	30.00	7.50	.....	2.50
78	5	2	365	465.00	34.00	8.10	.....	.....
80	5	2	375	550.00	38.00	8.80	.....	.....
82	5	2	390	640.00	43.00	9.60	.....	.....
84	5	2	500	730.00	48.00	10.50	.....	.....

Saws of odd diameter, not listed, take price of next larger size listed. No extra charge for saws one gauge thicker than list. No extra charge for saws one to three gauges thinner than list; when more than three gauges thinner, add 5 per cent to list for each gauge. Circular saws 48 inches and larger, thinner than 10 gauge, are not warranted. Circular saws 42 inches or less in diameter, beveled one gauge without extra charge; 44 inches or larger, beveled two gauges without extra charge. Circular saws hollow ground or concaved, add for each gauge hollow ground or concaved double list for beveling.

Bone, horn, and ivory saws, add 50 per cent to above list. No extra charge for fitting. When these saws are hollow ground or beveled, the 50 per cent advance is to apply only on the list price of a straight gauge saw and not to the extras for hollow grinding or beveling.

RESAWING OR SIDING SAWS

Fig. 1391

TAPER GROUND

Made of Silver Steel; finest workmanship. Fully guaranteed.

Dia., Ins.	Gauge	Wgt. Each, Lbs.	Each	Dia., Ins.	Gauge	Wgt. Each, Lbs.	Each
16	13x17	4	$8.00	28	9x13	21	$22.10
16	12x16	4¼	8.30	28	9x14	20¼	23.30
16	11x15	4¾	8.60	28	8x13	22¾	24.30
18	12x16	5¼	9.80	30	9x13	25	24.90
18	11x15	5¾	10.20	30	9x14	23¼	26.20
18	12x17	6¼	10.40	30	8x13	26	27.35
20	12x16	7¼	11.60	32	9x13	27	28.20
20	11x15	7¾	12.10	32	9x14	26¼	29.60
20	12x17	8½	12.30	32	8x13	29	30.90
22	11x15	10	13.90	34	9x13	31	31.65
22	10x14	10½	14.50	34	8x13	35	33.20
22	11x16	11	14.70	34	8x14	33	34.75
24	10x14	12½	16.20	36	8x13	39	37.80
24	9x13	13½	16.90	36	8x14	37	39.50
24	10x15	12	17.10	36	7x14	42½	43.00
26	10x14	16½	19.15	38	8x12	42¼	40.55
26	9x13	18¼	20.00	38	8x13	42	42.40
26	10x15	15¾	20.20	38	7x13	46	46.25

Note.—List prices of re-saws are figured by solid tooth circular saw list, adding extra gauges heavy, and gauges beveling, allowing one gauge heavier than standard and one gauge beveling on saws 42 inches and less in diameter, and two gauges on saws 44 inches and over, without extra charge.

EDGER SAWS—SOLID TOOTH

Diameter, Inches	12	14	16
Weight Each, Lbs	4¼	6	7¾
Each, 8-Gauge	$5.60	6.55	8.00
Weight Each, Lbs	3¾	5½	7¼
Each, 9-Gauge	$5.40	6.30	7.70
Weight Each, Lbs	3½	5¼	7
Each, 10-Gauge	$5.20	6.05	7.40
Weight Each, Lbs	3¼	5	6¾
Each, 11-Gauge	$5.00	5.80	7.10
Weight Each, Lbs	3	4¾	6½
Each, 12-Gauge	$4.80	5.55	6.80

Diameter, Inches	18	20	22	24
Weight Each, Lbs	9½	11¼	13	14¾
Each, 8-Gauge	$9.60	11.50	13.30	14.90
Weight Each, Lbs	9	10¾	12½	14¼
Each, 9-Gauge	$9.20	11.00	12.70	14.10
Weight Each, Lbs	8¾	10½	12¼	14
Each, 10-Gauge	$8.80	10.50	12.10	13.50
Weight Each, Lbs	8½	10¼	12	13¾
Each, 11-Gauge	$8.40	10.00	11.50	13.50
Weight Each, Lbs	8¼	10	11¾	13½
Each, 12-Gauge	$8.00	9.50	11.50	13.50

SHINGLE AND HEADING SAWS

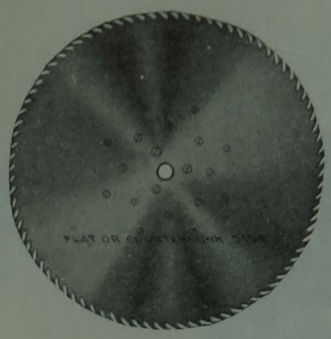


Fig. 1392

RIGHT OR LEFT HAND

Made of Silver Steel, taper ground; free from hard and soft spots; finely tempered; ground flat on rim, making regrinding unnecessary for a considerable time and insuring full benefit from the set.

Furnished either right or left hand. Cut shows right-hand saw.

In ordering Shingle and Heading Saws, state make of machine, diameter of saw, thickness or gauge at center and at rim, number of teeth, right or left hand, and speed.

If flange is to be supplied, send full and correct metal template of old flange, showing size and location of holes.

If only saw is wanted, send flange so it may be fitted to saw, or send template of holes and sample of screw by which to drill and countersink saw.

Diameter, Inches	30	32	34	36
Weight Each, Lbs	29	32	35	38
Each	$32.00	35.00	38.00	42.00
Diameter, Inches	**38**	**40**	**42**	**44**
Weight Each, Lbs	41	44	48	52
Each	$47.00	53.00	65.00	72.00
Diameter, Inches	**46**	**48**	**50**	**52**
Weight Each, Lbs	56	60	64	68
Each	$85.00	100.00	115.00	135.00
Diameter, Inches	**54**	**56**	**58**	**60**
Weight Each, Lbs	72	76	80	84
Each	$155.00	175.00	195.00	215.00

The standard shingle saw is from 7 to 9 gauge at the center and from 16 to 19 gauge at the toothed edge. Heading saws are usually from 5 to 7 gauge at the center and from 14 to 16 gauge on the rim.

Saws beveled not more than 8 gauges, but one gauge thicker at center than for saws of same diameter shown in solid tooth circular saw list, without extra charge. For any additional beveling, an extra charge will be made.

COLLARS

FOR SHINGLE, HEADING OR RE-SAWS

Supplied for any make of saw.

Size, Inches	18	19	20	21½
Each	$23.95	25.35	26.60	28.60

Size, Inches	22	24	25	26	30
Each	$29.25	31.90	33.25	34.60	40.00

Intermediate sizes take the next higher list.

INSERTED TOOTH CIRCULAR SAWS

Fig. 1393

Chisel Tooth No. 2½

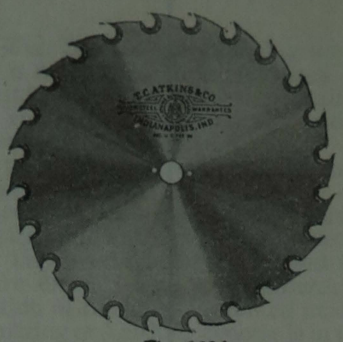


Fig. 1394

Fig. 1395

Chisel Tooth No 3

The holders are made of a special alloy steel and possess the highest degree of wearing qualities as well as proper spring to hold the teeth firmly in place. They will stand great pressure without becoming loose in the sockets or breaking. The bits or teeth are made from a high-grade alloy steel of a different formula. It takes a high temper, combining both strength and edge-holding qualities. The plate is made of silver steel. It will hold its tension, thus saving a large refitting and rehammering expense. Teeth readily discharge the dust and chips.

No. 3 style of tooth is in more general use than any other and meets the ordinary requirements.

No. 2½ is of medium size and suitable for saws for high feed mills where a large number of teeth are necessary, and for small saws in light gauges.

No. 30 is an especially strong tooth for heavy duty.

Diameter, Inches	Gauge at Rim	No. 2½		Nos. 3 and 30		Size Hole, Inches	Each, No. 2½	Each, Nos. 3 and 30	Each, Additional Gauge Heavier	Beveling New Saws, per Gauge
		Standard Number of Teeth	Greatest Number of Teeth that can be put in Saw	Standard Number of Teeth	Greatest Number of Teeth that can be put in Saw					
10	12	10	10	..	..	..	$15.15	.....	.....	.....
12	11	12	12	..	..	1	19.50	.....	$0.20	$0.35
14	10	14	14	..	..	1 1/8	23.00	.....	.25	.40
16	10	16	16	12	12	1 1/8	27.00	$27.00	.30	.50
18	10	18	20	14	14	1 1/4	31.00	30.00	.40	.60
20	9	20	22	14	16	1 5/16	36.00	34.00	.50	.70
22	9	22	24	16	18	1 5/16	42.00	38.50	.60	.80
24	9	24	26	18	18	1 3/8	46.00	42.00	.70	.90
26	9	26	28	18	20	1 3/8	52.00	46.00	.85	1.05
28	9	28	30	18	22	1 1/2	56.00	50.00	1.00	1.20
30	9	30	32	20	24	1 1/2	60.00	54.00	1.15	1.30
32	8	32	34	22	26	1 5/8	68.00	61.00	1.30	1.40
34	8	36	36	22	28	1 5/8	75.00	66.00	1.50	1.55
36	8	38	38	24	30	1 5/8	85.00	72.00	1.80	1.70
38	8	40	42	24	32	1 5/8	95.00	78.00	2.00	1.85
40	8	42	44	26	34	2	105.00	84.00	2.30	2.00
42	8	44	46	28	36	2	115.00	94.00	2.60	2.20
44	8	46	50	30	38	2	125.00	102.00	3.00	2.40
46	8	48	52	32	40	2	135.00	110.00	3.50	2.60
48	8	50	54	34	42	2	148.00	120.00	4.00	2.80
50	8	52	56	36	44	2	162.00	134.00	4.50	3.00
52	7	56	60	38	44	2	178.00	156.00	5.00	3.25
54	7	58	62	40	46	2	198.00	174.00	6.00	3.50
56	7	60	64	42	48	2	210.00	194.00	7.00	3.75
58	7	62	66	44	50	2	230.00	212.00	8.00	4.05
60	7	64	70	46	52	2	258.00	230.00	9.00	4.35
62	6	66	74	48	54	2	280.00	260.00	10.00	4.65
64	6	68	76	48	56	2	310.00	290.00	12.00	5.00
66	6	72	78	50	58	2	340.00	320.00	15.00	5.35
68	6	76	80	52	60	2	380.00	350.00	18.00	5.75
70	6	78	82	54	62	2	420.00	380.00	21.00	6.15
72	6	80	84	56	64	2	460.00	420.00	24.00	6.55

Bits or teeth $4.50 per hundred net. Holders or shanks $0.40 each, net. One extra set of teeth or bits given with each saw. Also two holders or shanks with saws 40 inches in diameter and under and three with saws over 40 inches in diameter.

Wrenches. No. 2½, each, $0.60. No. 3, each, $0.60. No. 3 teeth are made regular and short holder patterns One wrench given with saw or set of saws.

INSERTED TOOTH CIRCULAR SAWS

Fig. 1396
Chisel Tooth No. 4

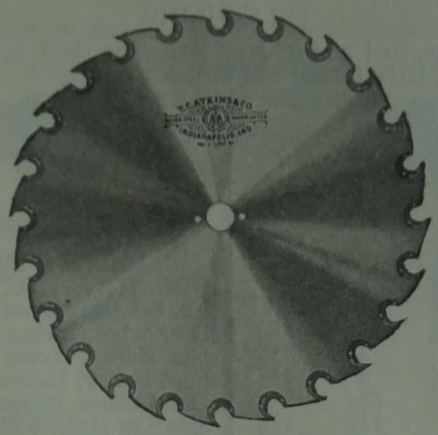


Fig. 1397

Fig. 1398
Chisel Tooth No. 5

The holders are made of a special alloy steel and possess the highest degree of wearing qualities as well as proper spring to hold the teeth firmly in place. They will stand great pressure without becoming loose in the sockets or breaking. The bits or teeth are made from a high-grade alloy steel of a different formula. It takes a high temper, combining both strength and edge-holding qualities. The plate is made of silver steel. It will hold its tension, thus saving a larger fitting and rehammering expense.

In designing these bits and holders, special attention has been given to their shape, in order to provide for each size that accuracy of cutting angle which insures the lightest running blade, combined with maximum wear. Teeth readily discharge the dust and chips without carrying them back into the kerf to cause undue heat on the rim of the saw.

Nos. 4 and 5 are extremely heavy, large patterns and are used extensively on the west coast. They are also used in top saws.

Dia. Inches	No. 4			No. 5			Size Hole, Inches	Each	Each Additional Gauge Heavier	Beveling New Saws, per Gauge
	Thickness Gauge at Rim	Standard Number of Teeth	Greatest Number of Teeth that can be put in Saw	Thickness Gauge at Rim	Standard Number of Teeth	Greatest Number of Teeth that can be put in Saw				
22	9	12	14	8	10	12	1 5/16	$38.50	$0.60	$0.80
24	9	14	16	8	12	14	1 3/8	42.00	.70	.90
26	9	14	16	8	12	14	1 3/8	46.00	.85	1.05
28	9	16	18	8	14	14	1 1/2	50.00	1.00	1.20
30	9	16	20	8	14	18	1 1/2	54.00	1.15	1.30
32	8	18	22	8	16	20	1 5/8	61.00	1.30	1.40
34	8	20	24	8	18	20	1 5/8	66.00	1.50	1.55
36	8	20	26	8	18	22	1 5/8	72.00	1.80	1.70
38	8	22	28	8	20	22	1 5/8	78.00	2.00	1.85
40	8	24	30	7	20	24	2	84.00	2.30	2.00
42	8	26	32	7	22	26	2	94.00	2.60	2.20
44	8	26	34	7	24	26	2	102.00	2.00	2.40
46	8	28	36	7	26	28	2	110.00	3.50	2.60
48	8	30	36	7	26	28	2	120.00	4.00	2.80
50	8	32	38	7	28	30	2	134.00	4.50	3.00
52	7	34	40	6	30	32	2	156.00	5.00	3.25
54	7	36	42	6	30	32	2	174.00	6.00	3.50
56	7	36	42	6	32	34	2	194.00	7.00	3.75
58	7	38	44	6	34	36	2	212.00	8.00	4.05
60	7	40	46	6	34	36	2	230.00	9.00	4.35
62	6	42	48	6	36	38	2	260.00	10.00	4.65
64	6	42	50	5	36	38	2	290.00	12.00	5.00
66	6	44	52	5	38	40	2	320.00	15.00	5.35
68	6	44	54	5	38	40	2	350.00	18.00	5.75
70	6	46	54	5	42	44	2	380.00	21.00	6.15
72	6	48	56	5	42	44	2	420.00	24.00	6.55

One extra set of teeth or bits, given with each saw. One wrench given with saw. Also two holders or shanks with saws 40 inches in diameter and under, and three with saws over 40 inches in diameter.

No. 4 Teeth	Per Hundred	$4.75 Net	No. 5 Teeth	Per Hundred	$5.00 Net
No. 4 Holders	Each	.45 Net	No. 5 Holders	Each	.50 Net
No. 4 Wrenches	Each	.70 Net	No. 5 Wrenches	Each	.70 Net

When ordering saws, give diameter of blade, gauge, style, right or left hand and number of teeth.

CIRCULAR SAW MANDRELS

SELF-OILING

These mandrels run absolutely true, cool and without jar. The shaft is lathe turned, of highest grade of steel. The pulleys are cast from soft gray iron, lathe turned and shrunk to shaft.

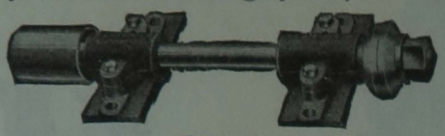


Fig. 1399

PULLEY OUTSIDE BOXES

NOS.	1	2	3	4
Ex. Length, Inches	16½	19	21½	24
Dia. Arbor, Inches	1 1/16	1 1/16	1 3/16	1 3/16
Dia. Pulley, Inches	3	3	3	3½
Face Pulley, Inches	3	3½	4	4½
Dia. Collars, Inches	3	3	3½	3½
Size Saw Hole, Inches	1	1	1⅛	1⅛
Size Saw, Inches	10–12	10–12	14–16	14–16
Weight Each, Lbs.	18½	20	27½	30½
Each	**$8.00**	**8.50**	**9.50**	**10.75**

NOS.	5	6	6½	7	8
Ex. Length, Inches	26	28	30½	30½	33½
Dia. Arbor, Inches	1 5/16	1 5/16	1 7/16	1 7/16	1 7/16
Dia. Pulley, Inches	4	4½	5	5	5½
Face Pulley, Inches	5	5½	6	6	6½
Dia. Collars, Inches	4	4	4½	4½	4½
Size Saw Hole, Inches	1¼	1¼	1 5/16	1⅜	1⅜
Size Saw, Inches	18	18	20–22	24–26	24–26
Weight Each, Lbs.	35½	40	47½	47½	51½
Each	**$12.50**	**14.00**	**16.00**	**16.00**	**18.00**

NOS.	9	10	11	12	13
Ex. Length, Inches	37	41	44½	48	54
Dia. Arbor, Inches	1 9/16	1 11/16	1 13/16	1 15/16	2 3/16
Dia. Pulley, Inches	6	7	8	10	12
Face Pulley, Inches	7	8	10	10	10
Dia. Collars, Inches	4½	5	5	5	5
Size Saw Hole, Inches	1½	1⅝	1⅝	1⅝	2
Size Saw, Inches	28–30	32–38	32–38	32–38	40–over
Weight Each, Lbs.	62	86	133	157	210
Each	**$22.50**	**28.00**	**33.50**	**40.00**	**50.00**

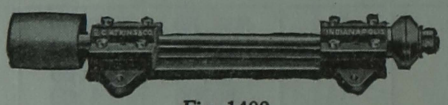


Fig. 1400

CONNECTED BOXES

NOS.	1	2	3
Ex. Length, Inches	23½	26½	28¾
Length Frame, Inches	17	19	20½
C. to C. Bolt Holes, Inches	13¾	14½	15¾
Dia. Arbor, Inches	1 5/16	1 1/16	1 3/16
Dia. Pulley, Inches	3	3½	4
Face Pulley, Inches	4	4½	5
Dia. Collars, Inches	3	3	3½
Size Saw Holes, Inches	⅞	1	1⅛
Size Saw, Inches	6–8	10–12	14–16
Weight Each, Lbs.	24	36½	45
Each	**$9.00**	**11.00**	**13.25**

NOS.	4	4½	5	6
Ex. Length, Inches	30½	33½	33½	36½
Length Frame, Inches	22	24	24	26
C. to C. Bolt Holes, Inches	16½	19	19	20¾
Dia. Arbor, Inches	1 5/16	1 7/16	1 7/16	1 9/16
Dia. Pulley, Inches	4½	5	5	6
Face Pulley, Inches	5½	6	6	7
Dia. Collars, Inches	3½	4	4	4½
Size Saw Hole, Inches	1¼	1 5/16	1⅜	1½
Size Saw, Inches	18	20–22	24–26	28–30
Weight Each, Lbs.	54½	56	60	78½
Each	**$15.50**	**17.75**	**17.75**	**20.00**

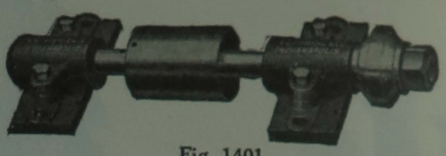


Fig. 1401

PULLEY INSIDE BOXES, SINGLE END

NOS.	1	2	3
Ex. Length, Inches	14	16	18
Dia. Arbor, Inches	1 1/16	1 1/16	1 3/16
Dia. Pulley, Inches	3	3	3
Face Pulley, Inches	3	3½	4
Dia. Collars, Inches	3	3	3½
Size Saw Hole, Inches	1	1	1⅛
Size Saw, Inches	10–12	10–12	14–16
Weight Each, Lbs.	17½	19	27
Each	**$7.50**	**8.00**	**9.00**

NOS.	4	5	6	6½
Ex. Length, Inches	20	22	24	26
Dia. Arbor, Inches	1 3/16	1 5/16	1 5/16	1 7/16
Dia. Pulley, Inches	3½	4	4½	5
Face Pulley, Inches	4½	5	5½	6
Dia. Collars, Inches	3½	4	4	4½
Size Saw Hole, Inches	1⅛	1¼	1¼	1 5/16
Size Saw Inches	14–16	18	18	20–22
Weight Each, Lbs.	29	34	38½	38½
Each	**$10.00**	**11.50**	**13.00**	**14.50**

NOS.	7	8	9	10
Ex. Length, Inches	26	28	32	36
Dia. Arbor, Inches	1 7/16	1 7/16	1 9/16	1 11/16
Dia. Pulley, Inches	5	5½	6	7
Face Pulley, Inches	6	6½	7	8
Dia. Collars, Inches	4½	4½	4½	5
Size Saw Hole, Inches	1⅜	1⅜	1½	1 5/8
Size Saw, Inches	24–26	24–26	28–30	32–38
Weight Each, Lbs.	47	49	50	77
Each	**$14.50**	**16.00**	**20.00**	**26.00**

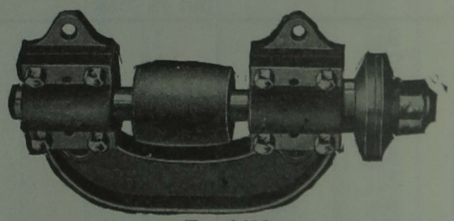


Fig. 1402

YOKE

NOS.	1	2	3	4
Out. to Out. Boxes, Inches	10	14	16	18
Dia. Arbor, Inches	1 5/16	1 5/16	1 1/16	1 3/16
Dia. Pulley, Inches	2½	3	3½	4
Face Pulley, Inches	3	4	4½	5
Size Collars, Inches	3	3	3	3½
Size Saw Hole, Inches	⅞	⅞	1	1⅛
Size Saw, Inches	6–8	6–8	10–12	14–16
Weight Each, Lbs.	18½	27	36	45
Each	**$9.00**	**10.50**	**12.00**	**14.00**

NOS.	5	5½	6	7
Out. to Out. Boxes, Inches	20	22	22	24
Dia. Arbor, Inches	1 5/16	1 7/16	1 7/16	1 9/16
Dia. Pulley, Inches	4½	5	5	6
Face Pulley, Inches	5½	6	6	7
Size Collars, Inches	3½	4	4	4½
Size Saw Hole, Inches	1¼	1 5/16	1⅜	1½
Size Saw, Inches	18	20–22	24–26	28–30
Weight Each, Lbs.	54½	56½	61	79
Each	**$16.00**	**18.00**	**18.00**	**20.00**

Mandrels fitted with pulley outside of boxes unless otherwise ordered. Prices do not include saws. When ordering saw mandrels, send sketch and state distance from saw to end of mandrel if the pulley is between the bearings. If the pulley is on the end of mandrel, state distance from saw to inside edge of pulley. Also state whether the pulley is on the right or left hand side of mandrel when the saw is running toward you.

BAND SAWS

The band saws listed below are made of silver steel. The heat treatment of these saws is based on a careful analysis of the steel and the character of the work which the saw is to perform. Each blade is tempered uniformly throughout by exclusive and patented process. There are no hard or soft spots. Saws are extremely pliable yet will not crack or lose teeth or points. They will hold their cutting edge and tension under forced feed and unusual conditions.

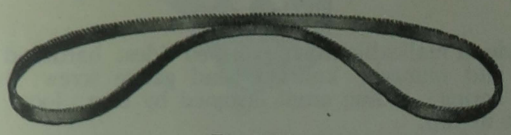


Fig. 1403

NARROW

For Re-Sawing and Scroll Work

Width, Inches	1/8	3/16	1/4	3/8
Standard Gauge	23	23	22	22
Points per Inch	8	7	6	5½
Weight per Foot, Lbs.	.0105	.0157	.0235	.0352
Per Foot	**$0.14**	**.15**	**.16**	**.17**

Width, Inches	½	5/8	¾	7/8	1
Standard Gauge	21	21	21	21	20
Points per Inch	5	4½	4	4	3½
Weight per Foot, Lbs.	.0535	.0670	.0805	.0939	1.175
Per Foot	**$0.18**	**.20**	**.22**	**.25**	**.27**

Width, Inches	1⅛	1¼	1⅜	1½	1¾
Standard Gauge	20	20	20	20	20
Points per Inch	3½	3½	3	3	3
Weight per Foot, Lbs.	1.316	1.471	1.608	1.763	2.057
Per Foot	**$0.29**	**.31**	**.35**	**.38**	**.45**

Prices include setting and filing. Saws with beveled backs take advance in list of 50% first gauge and 10% for each additional gauge. For saws with knife edge add $0.10 per foot to list. Saw can be furnished in coils, any length. Band saws for cutting bone, ivory, fibre, meat, brass and soft metals; also "B" tooth metal band saws for cutting thin metal, sheeting, etc., take advance in list of 25% above narrow band.

Price for Brazing Saws

Width, Inches	¼ to ½	5/8 to 7/8
Per Saw, Net	**$0.40**	**.50**

Width, Inches	1 to 1¼	1⅜ to 1½
Per Saw, Net	**$0.60**	**.80**

Width, Inches	1¾	2	2½
Per Saw, Net	**$0.90**	**1.00**	**1.25**

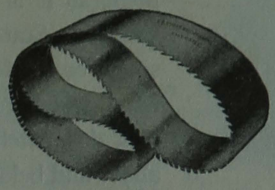


Fig. 1404

WIDE

Width, Inches	2	2½	3	3½
Standard Gauge	18 to 20	18 to 20	18 to 20	18 to 20
Weight per Foot, Lbs.	.28	.35	.42	.50
Per Foot	**$0.80**	**1.00**	**1.20**	**1.40**

Width, Inches	4	4½	5	5½
Standard Gauge	17 to 19	17 to 19	17 to 19	17 to 19
Weight per Foot, Lbs.	.57	.64	.83	.89
Per Foot	**$1.60**	**1.80**	**2.00**	**2.20**

Width, Inches	6	7	8	9
Standard Gauge	17 to 19	16 to 18	14 to 16	14 to 16
Weight per Foot, Lbs.	1.06	1.37	1.76	2.20
Per Foot	**$2.40**	**2.80**	**3.20**	**3.60**

Width, Inches	10	11	12	13
Standard Gauge	14 to 16	14 to 16	13 to 15	13 to 15
Weight per Foot, Lbs.	2.81	3.09	3.37	3.65
Per Foot	**$4.00**	**4.50**	**5.00**	**6.00**

Width Inches	14	15	16	17	18
Std. Gauge	13 to 15	12 to 14	12 to 14	12 to 14	12 to 14
Wgt. per Ft. Lbs.	4.50	4.82	5.92	6.29	6.66
Per Foot	**$7.00**	**8.50**	**10.00**	**14.00**	**18.00**

Saws of odd widths not listed take price of next wider size. For saws of heavier gauge than listed or more than 2 gauges thinner, add 5% to list for each gauge heavier or thinner.

Double Edge band saws, all widths advance 10% over lists of single edge.

Toothed blanks, same price as finished saws.

Bright band-saw blanks furnished to order, any width but not warranted.

SILVER SOLDER

Fig. 1405

The successful brazing of band saws largely depends on the solder used. This Silver Solder has proved to be the best adapted for brazing tempered steel. Can be furnished in ½, 5/8, ¾, 7/8, 1¼ Inch widths from stock.

One ounce to a box, **per Ounce** **$1.65**
In 6-ounce or larger lots, **per Ounce** **1.55**

SAWMILL DOGS

IDEAL

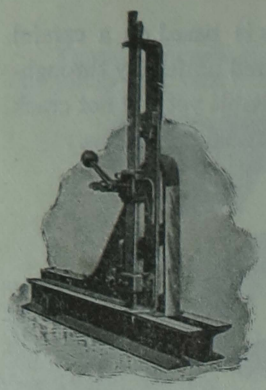


Fig. 1406

Has improved locking mechanism, controlled by the power lever, which automatically locks the dog bit at any point as it is forced into the timber. State size, number, single or duplex, right or left hand, when ordering. The duplex dog catches the log from above and below, otherwise the same as the single dog.

NOS.....	1	2	3	3sp.	4
Height, Inches....	38	41	45	49	51
Guide Bar, Inches	3x½	3½x½	4x⅝	4x⅝	5x¾
Slide Bar, Inches.	2x⅝	2½x⅝	3x⅝	3x⅝	3½x¾
Dog Bit, Inches .	1½x½	2x½	2½x½	2½x½	2½x¾
Weight, Each Single, Lbs.....	60	95	115	135	175
Each, Single Dog.	**$25.00**	**30.00**	**35.00**	**60.00**	**85.00**
Weight, Each, Duplex, Lbs....	80	110	125	150	235
Each, Duplex Dog	**$45.00**	**50.00**	**55.00**	**85.00**	**125.00**

SAW GUIDES

KNIGHT'S IMPROVED

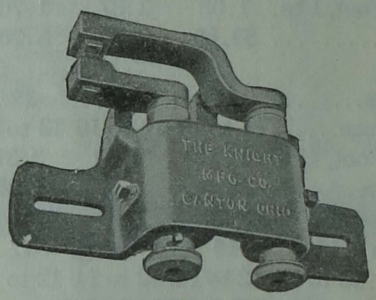


Fig. 1407

This style saw guide is suitable for heavy stationary mills. Each guide pin is operated by an independent screw and is moved in or out by small hand wheel at rear of base. This enables the sawyer to quickly and properly adjust the lead without inconvenience or danger. Saw may be removed from mandrel without changing guide or adjustment of guide pins. Base is reversible and can be used on either right or left hand sawmills.

Each

Size "W"—Weight Each, 65 Lbs.....**$15.00**

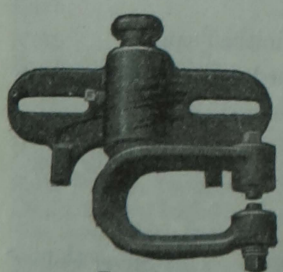


Fig. 1408

These saw guides are for use on medium size mills. The yoke, carried in the socket of the guide base, is adjusted for lead by a hand wheel and held in position by the set screw on top of base. By loosening set screw the yoke can be turned out of the way to permit taking off the saw without changing the lead. Large opening in yoke allows sawdust to pass through freely.

Each

Size "U"—2¾ Inches from Center of Guide Pin to Bottom of Base; Weight Each, 30 Lbs..... **$9.00**

Size "V"—4 Inches from Center of Base; Weight Each, 40 Lbs.....**$11.00**

SAW SETS

MORRILL

Fig. 1409

Made of malleable iron; polished sides; hardened steel anvil and plunger; knurled head gauge screw; heavy spiral spring; sliding anvil fastened by cam; loose lever handle at top.

Per Dozen

NO. 3—For Single Tooth Cross-Cut and Small Circular Saws; Length over all, 9 Inches; Weight per Dozen, 15 Lbs.....**$36.00**

NO. 4—For Wide Tooth Cross-Cut Saws; 9 Inches over all; Weight per Dozen, 15 Lbs.....**$36.00**

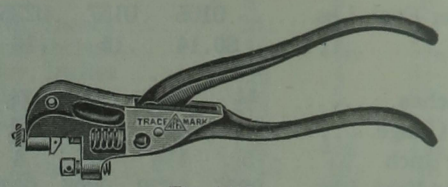


Fig. 1410

Made of semi and tool steel; polished sides; hardened steel plunger and anvil; gauge screw; heavy spiral spring; sliding anvil operated by set screw; loose lever handle at top. Made for timber saws, 6 to 14 gauge.

Per Dozen

NO. 5—Length Over All 15 Inches; Weight per Dozen, 21½ Lbs.....**$54.00**

PEXTO

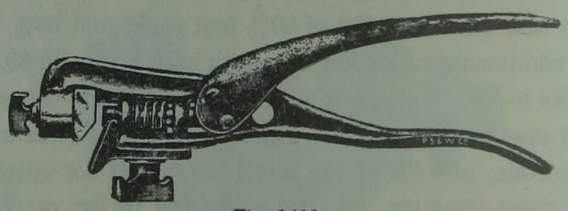


Fig. 1411

Made of malleable iron; polished; hardened steel anvil and plunger; spiral steel spring; sliding gauge regulated by thumb screw; loose lever handle at top; for cross-cut and small circular saws.

Per Dozen

NO. 17—Length Over All 9 Inches; Weight per Dozen, 17 Lbs..... $9.50

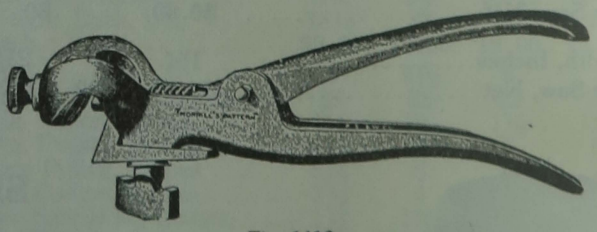


Fig. 1412

Made of malleable iron; polished; hardened steel anvil and plunger; spiral steel spring; sliding gauge regulated by thumb screw; for hand saws.

Per Dozen

NO. 7—Length Over All 6¾ Inches; Weight per Dozen, 8½ Lbs..... $5.00

SAW VISES

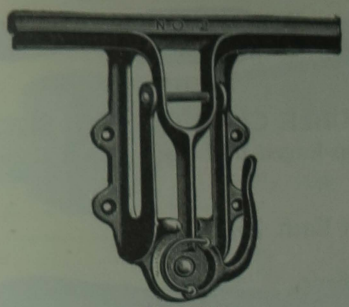


Fig. 1413

Wentworth Pattern made of malleable iron, Japanned; has rubber cushioned jaws; outer jaw pivoted; spring cam lever tightener. No. 1W is fastened to bench with 4 No. 12 wood screws. No. 3W has clamp for fastening to bench and is adjustable to swing forward.

	Per Dozen
NO. 1W—11 Inch Jaws; Height Over All, 9 Inches; Weight per Dozen, 65 Lbs.	$13.00
NO. 3W—11 Inch Jaws; Height Over Bench, 6 Inches; Over All Height, 11½ Inches; Clamp Opens, 2 Inches; Weight per Dozen, 72 Lbs.	15.00

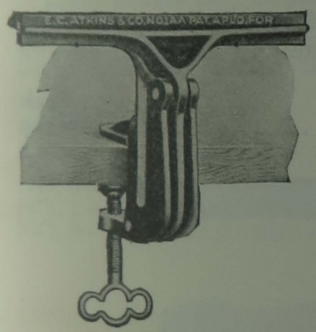


Fig. 1414

ATKINS' NOISELESS

Made of malleable iron, finely finished; strongly constructed; easily adjusted. A slight pressure on the outer jaw clamps the saw firmly into place. Vises operate on lock lever principle. The jaws are lined with rubber; noiseless and rigid; wearing parts are reinforced. With malleable iron screw clamp for fastening to bench.

	Per Dozen
NO. 1AA—11 Inch Jaw, Weight per Dozen, 69 Lbs.	$16.00

Similar to the vise listed above but is fastened to the work bench with 4 wood screws which may easily be removed for attachment wherever desired.

Fig. 1415

	Per Dozen
NO. 1A—11 Inch Jaw; Weight per Dozen, 63 Lbs.	$13.00
NO. 2A—15 Inch Jaw; Weight per Dozen, 99 Lbs.	15.00

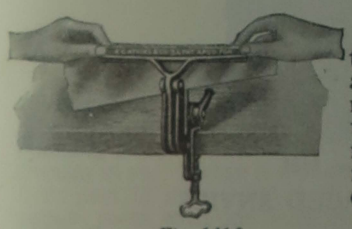


Fig. 1416

Fastened to bench table or board with malleable iron screw clamp; readily attached and detached; jaws adjusted by means of lever which permits vise being tilted any desired angle.

	Per Dozen
NO. 3A—11 Inch Jaw; Weight per Dozen, 78 Lbs.	$18.00

SAW FILING GUIDES

DISSTON

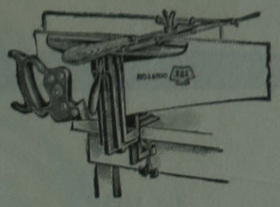


Fig. 1417

Designed for the use of those who are not sufficiently skilled in saw filing to file a saw correctly. Has marks on upper hub of swivel attachment to show when saw is adjusted properly to obtain the shape of tooth wanted. Furnished complete with clamp, file and handle.

	Each
D3—Length of Jaw, 12½ Inches; Weight Each, 16 Lbs.	$2.50

SIDE FILES

ATKINS' ADJUSTABLE

Fig. 1418

This file is the simplest tool ever invented for the purpose. The width of the set or swaged tooth is regulated by a single set screw. The clamp for holding the file is adjustable, permitting the use of any kind of file if one of the files made especially for them cannot be easily obtained. This tool is especially adapted for circular saws.

	Each
NO. 1—Weight Each, 2 Lbs.	$1.00

No. 2 file is adjustable for use of any kind of file. Particularly adapted for band and gang saws. It can be used on any width blade down to two inches wide.

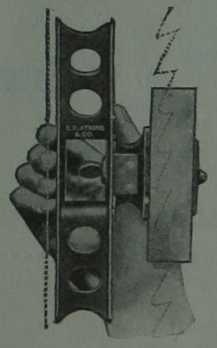


Fig. 1419

	Each
NO. 2—Weight Each, 1 13/16 Lbs.	$1.00
Extra Files for Nos. 1 and 2, per Dozen	3.00

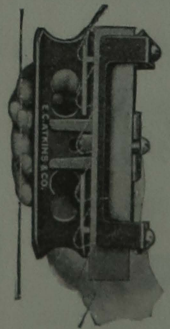


Fig. 1420

No. 3 file is adjustable for 8 and 9 inch files; file can be tilted to any desired angle; will take any width blade; adapted to band and gang saws.

	Each
NO. 3—Weight Each, 1⅜ Lbs.	$1.00
Extra Files, per Dozen	3.60

SAW MAKERS' TOOLS

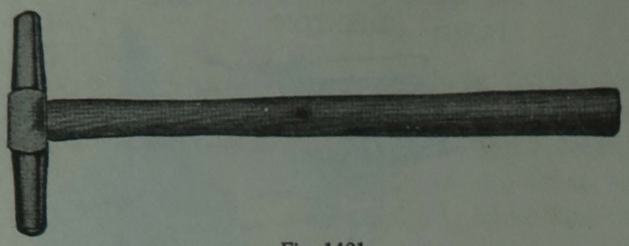


Fig. 1421

SWAGING HAMMERS

Drop forged head; tested; finely polished; supplied with high grade hickory handle.

Size, Inches	3/4	7/8	1
Weight Each, Lbs	1/2	1 1/16	1 3/16
Each	$1.50	1.80	2.25

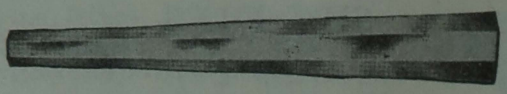


Fig. 1422

BAR SWAGES

Every sawyer or filer should have one of these swages and hammers for drawing out short teeth or for swaging saws before using the regular swage or upset.

NO.	No. of Sides	Dimensions, Inches	Weight, Lbs.	Each
1	6 or 8	11x1 x1/2	13/16	$3.75
2	6 or 8	11x1 1/4x5/8	1 11/16	4.50
3	6 or 8	11x1 1/2x3/4	2 9/16	5.25
4	6 or 8	11x1 3/4x7/8	3 1/2	6.00

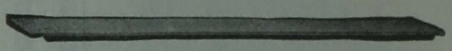


Fig. 1423

LEVELING TABLES

Made 12 Inches Wide, 7 Feet Long, Weight per Ft., 80 Lbs. ..... Each $18.00

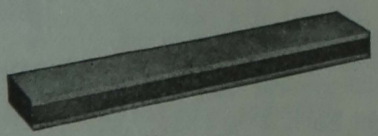


Fig. 1424

LEVELING BLOCKS

Surfaced on both sides.

Width, Inches	12	12	12	12	12
Thickness, Inches	2	2 1/2	3	3 1/2	4
Weight per Ft., Lbs.	80	100	120	140	160
Per Lineal Ft.	$6.00	7.50	9.00	10.50	12.00

Other widths at proportionate prices.

Fig. 1425

STRAIGHT EDGES

Per Ft. $1.00

Fig. 1426

DOUBLE CIRCULAR SAW SETS

Made of drop-forged tool steel; to suit circular saws of different sizes.

	Each
NO. 1—Weight Each, 1 5/8 Lbs.	$2.25

Fig. 1427

SHINGLE SAW SETS

Made of drop-forged steel; hardwood handle; for heading, shingle or small saws.

	Per Dozen
NO. 2—Weight per Dozen, 3 3/4 Lbs.	$9.00

Fig. 1428

SHINGLE SAW SETS, SMALL

Made of drop-forged tool steel to suit band saws of different sizes.

	Each
NO. 3—Weight Each, 5/8 Lb.	$1.50

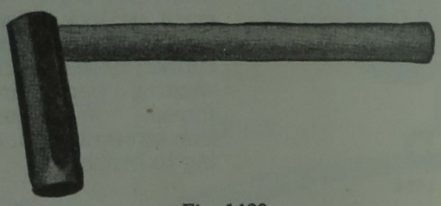


Fig. 1429

ROUND-FACED HAMMERS

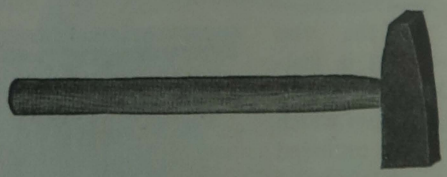


Fig. 1430

SQUARE-FACED HAMMERS

The above hammers can be furnished in any weight desired.

Per Lb. $0.60

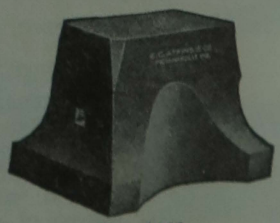


Fig. 1431

STEEL-FACED ANVILS

	Per. Lb.
Anvils weighing less than 180 Lbs.	$0.15
Anvils of 180 Lbs. or over	.18

SAW SWAGES

MIXTER—UPSET

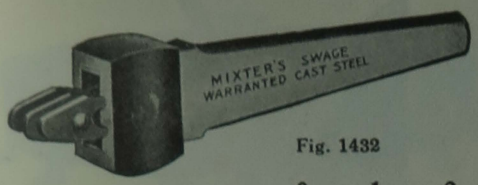


Fig. 1432

NOS	0	1	2	3
Weight, Lbs	1¾	1¼	½	3/16
Each	$4.00	5.00	6.00	7.00

Nos. 0 and 1 for small thin saws.
No. 2 for medium saws, 8 to 12 gauge.
No. 3 for largest size saws, 5 to 10 gauge.

Order swages by number; specify type of saw and gauge on which swage is to be used.

Fig. 1433

These swages may be successfully used on all kinds of saws; the shank is of the very highest quality tool steel; the bands of high-grade soft steel; will stand the strain without cracking or expanding.

NOS	0	1	2	3
Weight Each, Lbs	1½	1⅛	7/16	⅛
Each	$3.00	2.75	2.25	1.75

NO. 0—For large circular saws, 5 to 10 gauge.
NO. 1—For large circular saws, 8 to 12 gauge.
NO. 2—For small circular and mill saws of thin gauge.

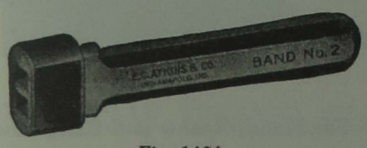


Fig. 1434

Each

NO. 2—For band and circular saws; Weight Each, 6½ Ounces $2.25

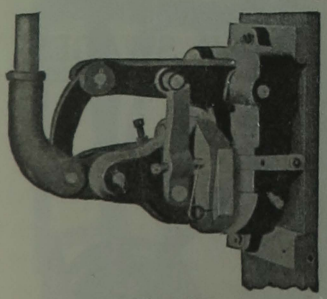


Fig. 1435

KINNEY IMPROVED

Massive and powerful. Dies and working parts are of large size and hard temper; easily replaced when worn. Hanging irons and tackle blocks furnished for supporting circular saws. Swage is mounted on upright post; extends from post 18 inches and is 18 inches wide. Clamps and swages tooth with one lever movement; for gang and circular saws, 15 gauges and heavier.

Each

NO. 13—Height, 24 Inches; Weight Each, 300 Lbs. $125.00

SAW SWAGES

CHAMPION

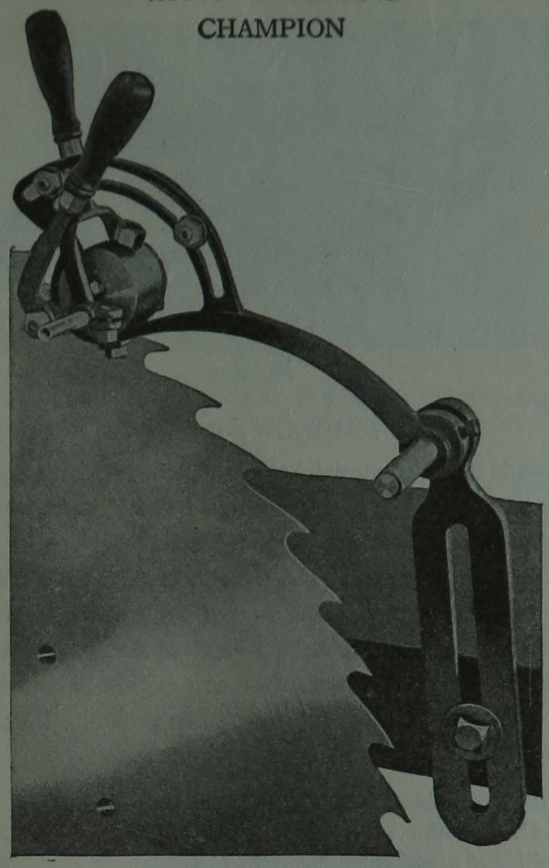


Fig. 1436

This machine is made in three sizes, suitable for swaging all classes of thin circular saws from 10 to 20 gauge in thickness. It is well adapted for swaging shingle saws; can be used on any bench. All machines have the same working parts, the only difference being in size of parts and style of frame. The die has eccentric surface the full length, and is arranged so that when one side becomes worn it can be turned end for end and the other side used. The anvil die is flat on both sides and round on the edges; can be worked in four different positions; the blocks are of best tool steel. Open wrench furnished with each.

STYLE C

For shingle and very light circular saws, 14 to 20 gauge. Block, 2½ inch diameter, 2 inches long; 8¼ inch die lever; 7 inch clamp lever; 7/16 inch die and clamp screws.

Each

NO. 1—Weight Each, Lbs. $37.50

STYLE C

For light circular saws, 13 to 15 gauge; block, 3 inch diameter, 2¼ inches long; 12 inch die lever, 10 inch clamp lever; ⅝ inch die and clamp screws; automatic feed finger.

Each

NO. 2—Weight Each, Lbs. $43.70

STYLE C

For light circular saws, 10 to 14 gauge; block, 3¼ inch diameter, 2¾ inches long; 16 inch die lever; 12 inch clamp lever; ¾ inch die and clamp screws; automatic feed finger.

Each

NO. 3—Weight Each, Lbs. $46.88

STYLE D

Similar to Style "C" but for very heavy circular saws 4 to 10 gauge; block, 3¾ inch diameter, 3 inches long; compound die lever 8 and 24 inches in length; 16 inch clamp lever; ⅞ inch die and clamp screws; automatic feed finger.

Each

NO. 3—Weight Each, Lbs. $56.25

SAW SWAGE SHAPERS

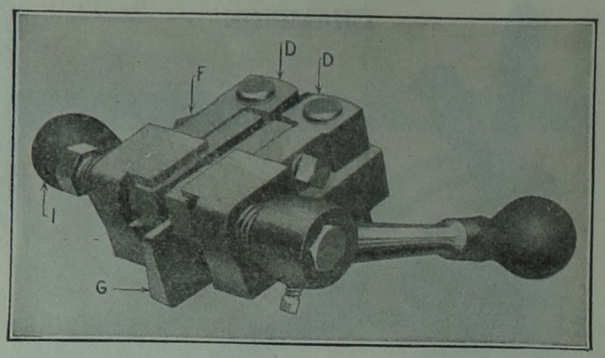


Fig. 1437

PRIBNOW—IMPROVED

Made of best material. Contains all the latest improvements. It is easy to operate and has few parts, the adjustment of which are very accurate. All are in plain sight of the operator. The shaper completes the work of the swage compressing the swaged point of the tooth and making it more durable. It also gives it that form which affords perfect clearance in the cut. Great uniformity in proper points and bevel of saw teeth insured. B1-D has double lever; other sizes have one lever.

NOS.	Suitable for Saws	Gauge	Wgt. Each, Lbs.	Each
B1-D	Circular	5 to 10	9	$37.50
B1	Band and Circular	10 to 13	8	35.00
B2	Band and Circular	13 to 16	6	33.00
B3	Band and Circular	16 to 22	5	33.00
G2	Gang	13 to 16	5	33.00
C2	Cylinder	15 to 16	7	36.00
1	Band and Gang	14 to 18	5	25.00
2	Band and Gang	12 to 16	6	25.00
3	Special for Bands	11 to 14	8	27.50

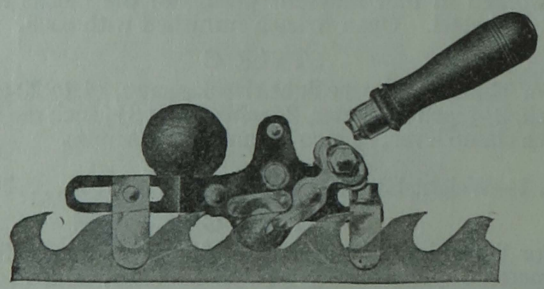


Fig. 1438

CHAMPION SHAPERS

For band or circular saws. All wearing parts are of hardened steel; shaper is easy to adjust and operate; shapes all teeth with a bevel from the point down and from face back, forming a tooth with clearance both ways. When ordering state kind of saw, gauge and spacing of teeth on which machine is to be used.

	Each
NO. 1—For Saws 16 to 20 Gauge	$22.00
NO. 2—For Saws 14 to 16 Gauge	27.50
NO. 3—For Saws 11 to 14 Gauge	33.00

SAW SWAGE SHAPERS

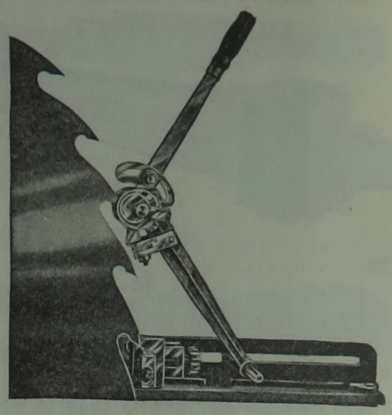


Fig. 1439

For Shingle Log and Small Circular Saws

Size	1	2	3
For Saws, Gauge Nos.	5 to 13	12 to 18	16 to 22
Weight Each, Lbs.	12	8	6
Each	$37.50	31.25	31.25

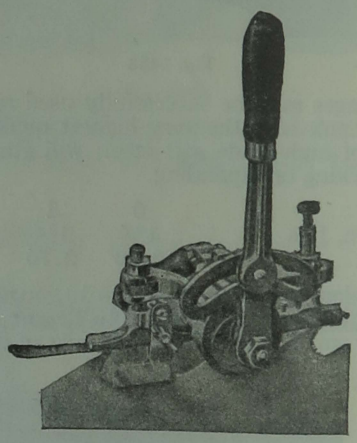


Fig. 1440

For Hand, Resaw and Gang Saws

Size	1	2	3
For Saws, Gauge Nos.	10 to 12	12 to 18	16 to 22
Weight Each, Lbs.	9	7	5
Each	$37.50	31.25	31.25

BAND SWAGES

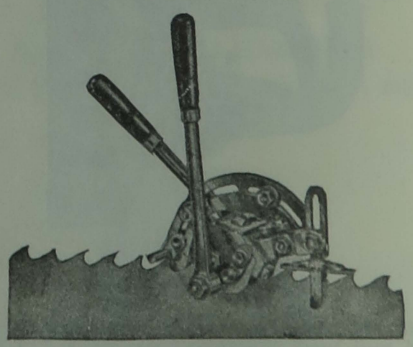


Fig. 1441

Band Swage for Band and Gang Saws

Size	0	1	2	3
For Saws, Gauge Nos.	8 to 13	12 to 16	16 to 18	18 to 26
Weight Each, Lbs.	17	12	5	3
Each	$47.50	41.25	35.00	32.50

PULLEYS AND STANDS
FOR BAND SAWS

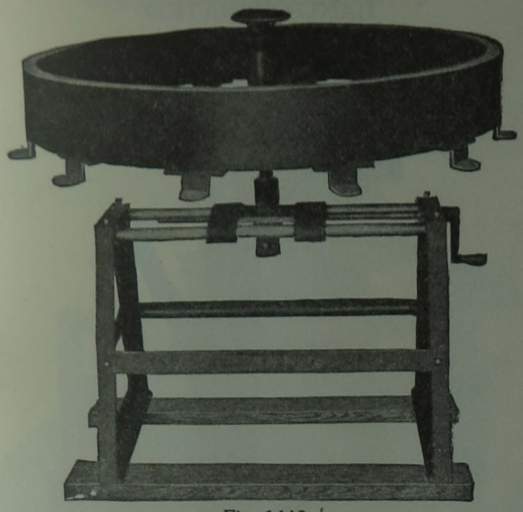


Fig. 1442

Pulleys have vertical adjustment to suit varying widths, and one has a horizontal adjustment to accommodate different lengths of saws. Pulleys can be supplied on orders as idlers for use with back feed pawl system on sharpeners or for supporting saw at hammering bench in connection with saw stretcher.

	Per Set
5-Ft. Pulley; Extra Heavy Stand; Weight Each, 750 Lbs	**$190.00**
4-Ft. Pulley; Extra Heavy Stand; Weight Each, 650 Lbs	**165.00**
5-Ft. Pulley; Standard Stand; Weight Each, 500 Lbs	**140.00**
4-Ft. Pulley; Standard Stand; Weight Each, 450 Lbs	**115.00**
3-Ft. Pulley; Saw Stand; Weight Each, 350 Lbs	**80.00**

OPENING JAW FILING CLAMPS
FOR BAND GANG AND RE-SAWS

Fig. 1443

For medium width log bands or band re-saws; has hinged jaw; can be opened quickly for insertion of saw or closed and locked by foot movement.

NOS.	Capacity, Inches	Length Jaws, Inches	Weight Each, Lbs.	Each
405	6	36	160	**$50.00**
406	8	42	225	**57.50**
407	10	48	260	**65.00**

FILING VISES

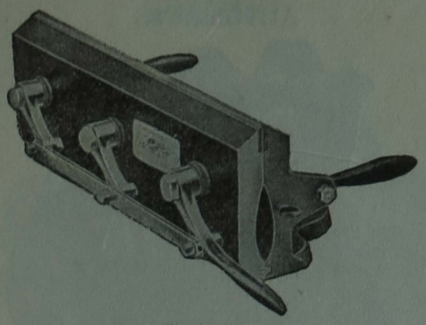


Fig. 1444

For scroll band saws, 1/8 to 2½ inches wide; clamps instantly and perfectly.

	Each
NO. 87A—20 Inch Jaw; Weight Each, 55 Lbs	**$22.50**

BAND SAW DRILLS

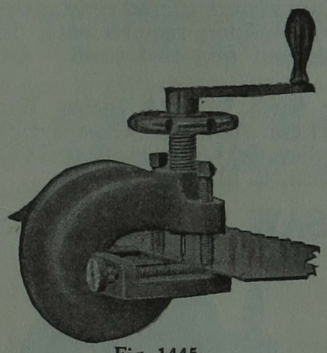


Fig. 1445

For arresting cracks. Will drill a hole at the end of a crack extending inward 3 inches or less from edge of saw.
NO. 32—Weight Each, 10 Lbs. **$18.75**

BAND SAW SETTERS
AUTOMATIC HAND-OPERATED

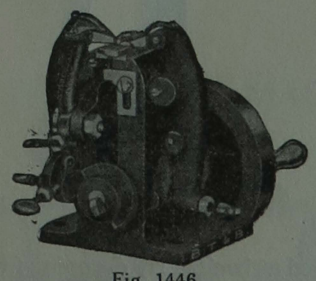


Fig. 1446

One revolution of crank feeds and sets two teeth, one to the right and the other to the left. All movements are automatic and rapid. The tooth stays where set; force of blow instantly regulated by thumb screw at end of setting lever; pawl and hammer of finest tool steel, properly hardened. All adjustments are easily made.

	Each
NO. 82—Setter for Saws, 1/8 to 1 Inch; 5/8 Inch Spacing or Less; Weight Each, 20 Lbs	**$35.00**
NO. 83—Setter for Saws, 1/8 to 3 Inches; 1¼ Inch Spacing or Less; Weight Each, 29 Lbs	**45.00**

POWER BAND SAW SETTERS

AUTOMATIC

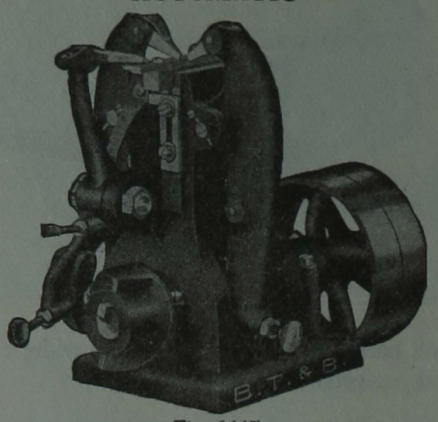


Fig. 1447

A power setting machine produced to meet the demand of the saw makers and woodworking plants that have a large amount of setting to do and that require a rapid-working and well-built machine. It can be run at a speed of 200 teeth per minute, although it should not be operated over 100 teeth per minute if used constantly, as this speed is sufficient for all ordinary requirements. Each revolution of pulley feeds and sets two teeth. Adjustments are easily made.

NO. 83A—For Saws 1/8 to 3 Inches Wide, 1¼ Each Spacing or Less; Floor Space Occupied, 10x14x17 Inches; Pulley, 6x1¼ Inches; 25 to 50 R. P. M.; Weight Each, 45 Lbs. **$70.00**

SAW STRETCHERS

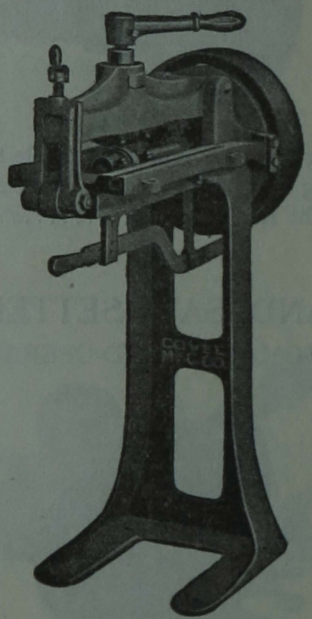


Fig. 1448

Head is hinged at back. By dropping front yoke upper frame can be swung forward. This arrangement makes it easy to test tension of the saw. Roll shafts are connected by cut gears; driven by internal gear, controlled by clutch, operated by hand lever, shown in cut, which instantly starts or stops rolls.

For 8 and 10 Inch Band Saws. Drive pulley, 15 Inch diameter for 3½ Inch belt; saw travel, 30 ft.; floor space occupied, 21x29 Inches; extreme height on legs, 49 Inches.

NO. 78

Length, Inches	**8 Inch**	**10 Inch**
Weight Each, Lbs.	375	400
With Base, Each	**$187.50**	**200.00**
Weight Each, Lbs.	300	330
Without Base, Each	**$175.00**	**180.00**

SAW GUMMERS AND SHARPENERS

HAND-OPERATED

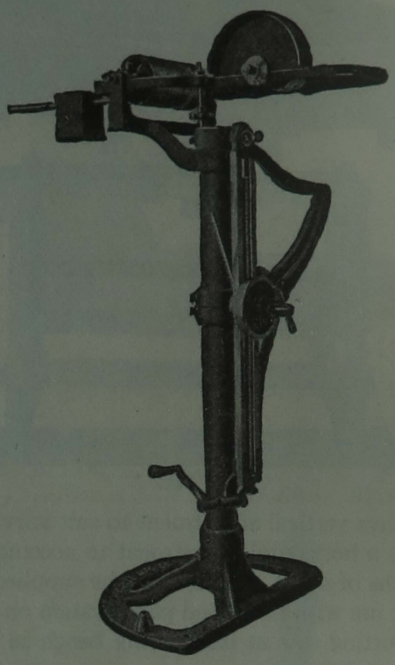


Fig. 1449

Cut Shows No. 46 Large Hand Sharpener

Readily adjustable and capable of doing excellent work. Suitable for mills and woodworking plants.

These saw sharpeners are made of the best material throughout and are finely finished. The saw is raised or lowered by means of a screw feed, operated by a hand wheel.

The larger machine has rack and pinion device for shifting saw sidewise to accommodate hook. This size is made right or left hand as desired, which must be stated on order. Cut shows right hand. Any hook and any size of gullet outline may be obtained if suitable grinding wheels are used.

One grinding wheel, internal belting with saw cone to accommodate arbor hole 1 to 2½ inches in diameter, furnished with each machine.

When ordering give range in diameter of saws to be sharpened, size of arbor holes and state if extra grinding wheels or saw cones are wanted.

Each

NO. 46—Large Size. T. & L. Pulley, 6 Inch Diameter for 2½ Inch Belt; Speed, 1500 R. P. M.; 12 Inch Grinding Wheel with 15/16 Inch Arbor Hole; Floor Space, 42x36 Inches; Height, 66 Inches; Weight Each, 375 Lbs. **$75.00**

NO. 46—Small Size. T. & L. Pulley, 6 Inch Diameter for 2½ Inch Belt; Speed 1500 R. P. M.; 10 Inch Grinding Wheel with 15/16 Inch Arbor Hole; Floor Space, 13x16 Inches; Height, 38 Inches; Weight Each, 200 Lbs. **55.00**

Can be furnished with motor if desired. When motor is wanted order should state current specifications.

AUTOMATIC RIP AND CROSS CUT SAW SHARPENERS

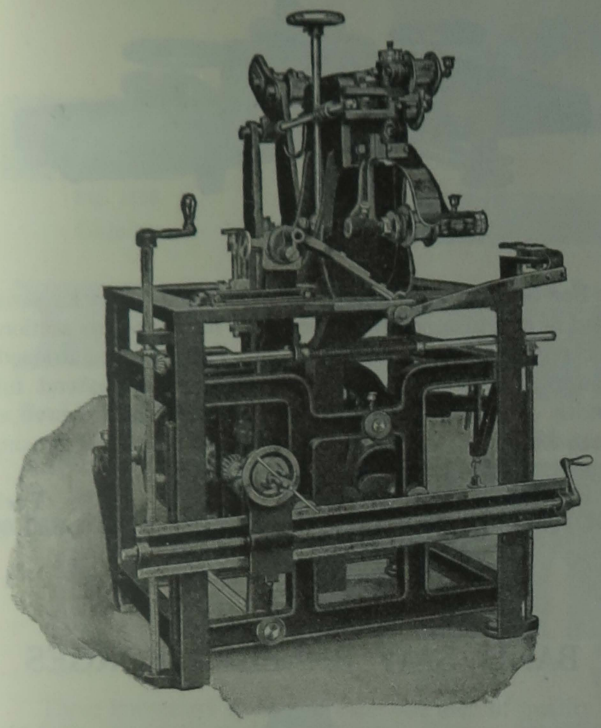


Fig. 1450

This machine is designed for a wide variety of rip and crosscut saws, ranging from 36 inches down to 6 inches in diameter, with teeth from ten points per inch up to 2¾ inch spacing. The grinding wheel arbor is driven by one long belt direct from the countershaft over idlers, adjustable to keep the belt at the proper tension and so arranged that the belt strain is relieved when grinding wheel leaves throat of teeth.

The grinding wheel head is equipped with beveled gibs; the feed arm operates between adjustable sliding ways; the arbor is supported in strong, rigid head. The beveling mechanism for cut-off saws is accurate and is attached to head by ball and socket joint; adjustable for grinding any bevel on cut-off saws from 0 to 40 degrees, by means of hand wheel control.

When ordering give range in diameter of saws and arbor holes, etc., spacing from point to point and send drawing showing all gullet outlines.

Regular equipment includes, 8-inch grinding wheel, internal belting, oil cups, wrench, adjustable cams and saw cones for arbor holes 1 to 2⅜ inches. Equipped for grinding inserted point cut-off saws when so ordered.

	Each
NO. 736—T. & L. Pulleys, 8x2½ Inches; Speed, 340 R. P. M.; 8-Inch Grinding Wheel, ¾-Inch Arbor Hole; Floor Space, 36x36 Inches; Height, 48 Inches; Weight 725 Lbs.	$245.00

AUTOMATIC SCROLL BAND SAW FILERS

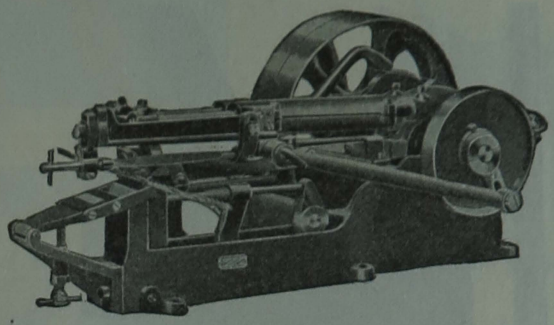


Fig. 1451

These saw filers support saw on pegs, racks or pulleys —in latter case, loosely strained to avoid being given any momentum when feeding ahead. Every machine is adjusted to saw and tested before shipment. Will go forward adjusted to any spacing or width of saw that is desired. Saw clamp is adjusted to suit saws of 18 to 20 gauge. Re-adjustment of clamping device is rarely necessary unless saw is heavier or lighter gauge. The stroke of the pawl is adjustable.

	Each
NO. 40—For Saws ⅛ to 1 Inch Wide; Spacing ½ Inch or Less	$85.00
NO. 40A—For Saws ⅛ to 2 Inches Wide; Spacing ½ Inch or Less	90.00
NO. 49B—For Saws ⅛ to 3 Inches Wide; Spacing ½ Inch or Less	100.00

Weight each of above machines 105 Lbs.; measurements, 34x18x12 Inches; T. & L. pulley, 12x1½ Inches; 50 R. P. M.

KNIFE BALANCING MACHINES

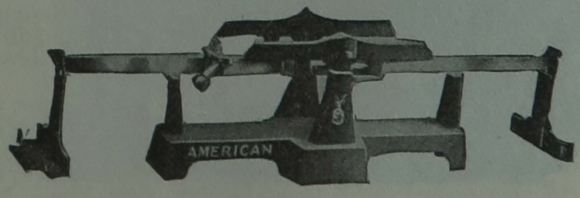


Fig. 1452

Planer knives must be balanced, both against one another and endwise. It is also important that knives used on side heads should be in balance. This machine will do the work for you quickly and accurately.

	Each
NO. 1530—Weight Each, 40 Lbs.	$20.00

SHEARING AND CROSS-CUTTING MACHINES

FOR BAND OR GANG SAWS

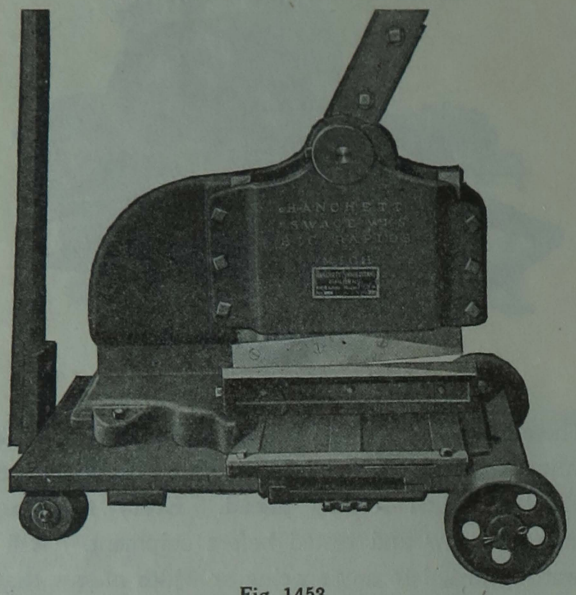


Fig. 1453

Powerful shearing machine, cuts full rated capacity at one stroke. Has adjustment for blades that insures a perfect shear; has also gauge for cutting lengthwise or crosswise. Furnished with truck, the front wheels of which will guide in either direction.

NOS	14	16	20
Size, Inches	14	16	20
Weight with Truck, Lbs.	700	775	950
Each, with Truck	**$155.00**	**190.00**	**250.00**
Weight without Truck, Lbs.	575	660	850
Each, without Truck	**$140.00**	**170.00**	**220.00**

Extra sets of shearing dies: For No. 20, $25.00; No. 16, $23.75; No. 14, $22.50.

COMBINATION TOOTHING AND SHEARING MACHINES

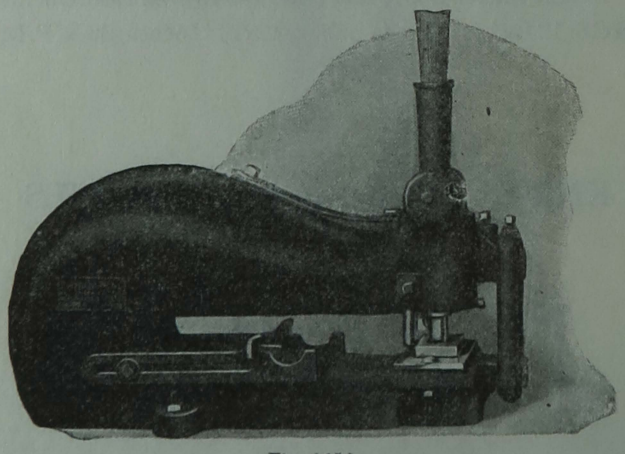


Fig. 1454

For shearing, crosscutting or re-toothing band or gang saws. Dies for re-toothing are of the latest box type and can be made up to punch any desired tooth outline.

NOS	0	6	4	2
Capacity, Inches	20	16	14	12
Weight Each, Lbs.	800	600	450	375
Each	**$220.00**	**190.00**	**155.00**	**145.00**

Extra sets of re-toothing dies can be furnished for **$30.00 per set**; shearing dies, **$22.50 per Set.**

BRAZING CLAMPS

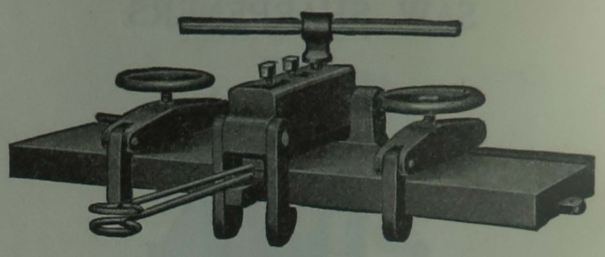


Fig. 1455

For brazing wide hand re-saws or light gauge log saws. Bed of cast iron, solid; center clamp made in two sections for regulating if required; clamp screws, case-hardened; clamping dogs of forged steel; side clamps extend full width of table; brazing-iron slot planed true to serve as seat for wedge; equipped with one set of planed brazing irons $\frac{9}{16}$x1$\frac{1}{2}$x11 inches, with handles.

	Each
NO. 29—For 10 Inch Saws; Weight Each, 200 Lbs.	$50.00

BAND SAW BRAZING FORGES

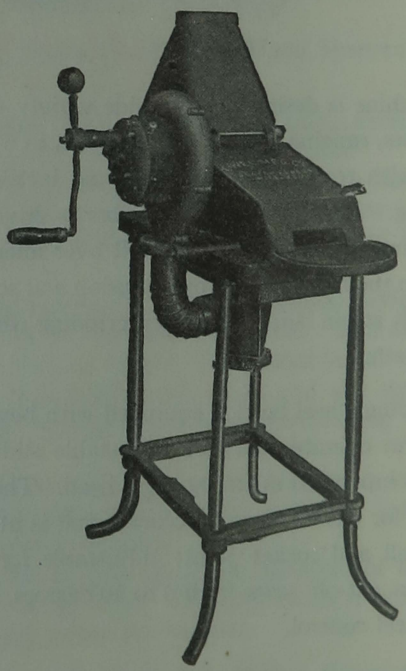


Fig. 1456

Firebox made of cast iron, packed with asbestos and provided with a hinged front; hand operated, geared blower, the handle of which can be turned in either direction; equipped with oil cups; all gears running in oil.

NOS	132	132
Size Firebox, Inches	14	20
Floor Space, Inches	33x22	37x22
Height, Inches	53	53
Weight Each, Lbs.	350	425
Each	**$82.50**	**95.00**

PLANER AND MACHINE KNIVES

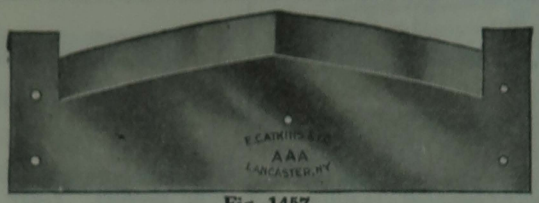


Fig. 1457
Shingle

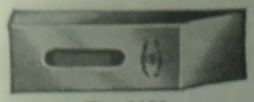


Fig. 1458
Gaining

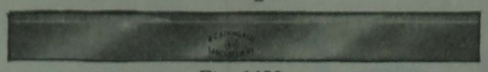


Fig. 1459
High Speed Steel Planer

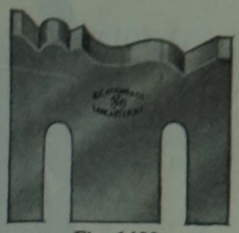


Fig. 1460
Moulding Cutter

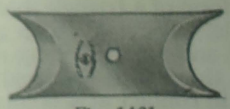


Fig. 1461
Double End Chain

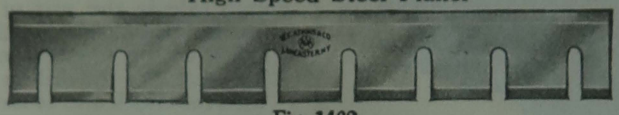


Fig. 1462
Planer and Jointer

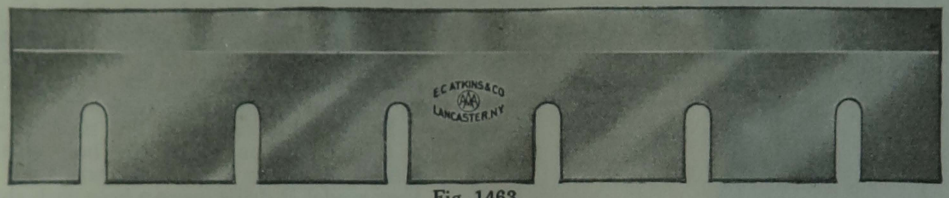


Fig. 1463
Veneer

These knives are made with the one idea of quality always uppermost. Each knife is guaranteed to be absolutely free from imperfections as to material, temper, grinding, welding or finish, and we guarantee the fit, provided proper instructions have accompanied the order.

The tool steel used is of a high grade, of good quality and selected with great care for the work to be done in each case.

In ordering planer and other knives, etc., place the knife face down with the bevel up on a strong piece of paper, mark around to show the length of knife and size and position of slots, and be sure to state the width and thickness desired.

YOUR ORDER MUST INCLUDE THIS INFORMATION

How many are wanted, and how many knives in a set?
Are they for a slotted head? if so, give number and size of slots.
Are they for a solid head? if so, a pattern will be required.
Should knives be back-beveled or left square?
What kind of wood will they be required to cut?
Give the name of maker of machine for which knives are wanted.

PLANER AND BARKING KNIVES WITH STRAIGHT EDGES

Flat Fur Cutting Bed Knives and ordinary Straight Knives of same finish (not otherwise provided for). 3/8 inch thick or less.

Width, Inches	Price per Inch of Length							
	Over 12 to 31	Over 31 to 40	Over 40 to 50	Over 50 to 60	Over 60 to 70	Over 70 to 80	Over 80 to 90	Over 90 to 100
4 Inches or Less	$0.21	$0.24	$0.28	$0.32	$0.39	$0.46	$0.53	$0.60
Over 4 to 4½	.24	.28						
Over 4½ to 5	.28							
Over 5 to 5½	.32							
Over 5½ to 6	.36							
Over 6 to 6½	.40							
Over 6½ to 7	.45							
Over 7 to 7½	.49							
Over 7½ to 8	.53							
Over 8 to 8½	.59							
Over 8½ to 9	.66							
Over 9 to 9½	.73							
Over 9½ to 10	.80							
Over 10 to 10½	.87							
Over 10½ to 11	.94							
Over 11 to 11½	1.01							
Over 11½ to 12	1.08							

Figure at actual measurement, viz.: 24⅛, 50⅛, etc. Knives wider or thicker in one part than another, figure by widest and thickest measurement. Measure by longest length, whether cutting edge or back. All Knives longer or wider than in this list unless otherwise provided for, figure by Special List. Knives with Counter-bored Slots, add 10 per cent. Advance for extra thickness all knives as follows:

Over 3/8 to 7/16 thick, 10 per Cent. Over 3/4 to 7/8 thick, 30 per Cent.
Over 7/16 to 1/2 thick, 15 per Cent. Over 7/8 to 1 thick, 35 per Cent.
Over 1/2 to 5/8 thick, 20 per Cent. Over 1 to 1¼ thick, 50 per Cent.
Over 5/8 to 3/4 thick, 25 per Cent. Over 1¼ to 1½ thick, 75 per Cent.
Over 1½ to 2 thick, 100 per Cent.

Solid Steel Planer Knives, etc., over 12 inches long, advance 25 per cent. 5/16 inch thick or less and 50 per cent. 3/8 inch thick or more.

Straight Knives, 12 inches long or less, 3/8 thick or less.

2 inches long or less, 4 inches wide or less..... **$0.97 Each**
Over 2 to 4 inches long, 4 inches wide or less..... **1.20 Each**
Over 4 to 6¼ inches long, 4 inches wide or less..... **1.50 Each**
Over 6¼ to 12 inches long, 4 inches wide or less..... **.24 per Inch**

If over 4 inches wide, increase — for each additional inch or fraction thereof. Add 50 per cent. for knives plated all over one face.

Advance for extra thickness. Counter-bored slots, add 10 per cent. Beveled ends, add $0.15 per knife to list.

SQUARE HOLE DRILLING AND MORTISING MACHINES

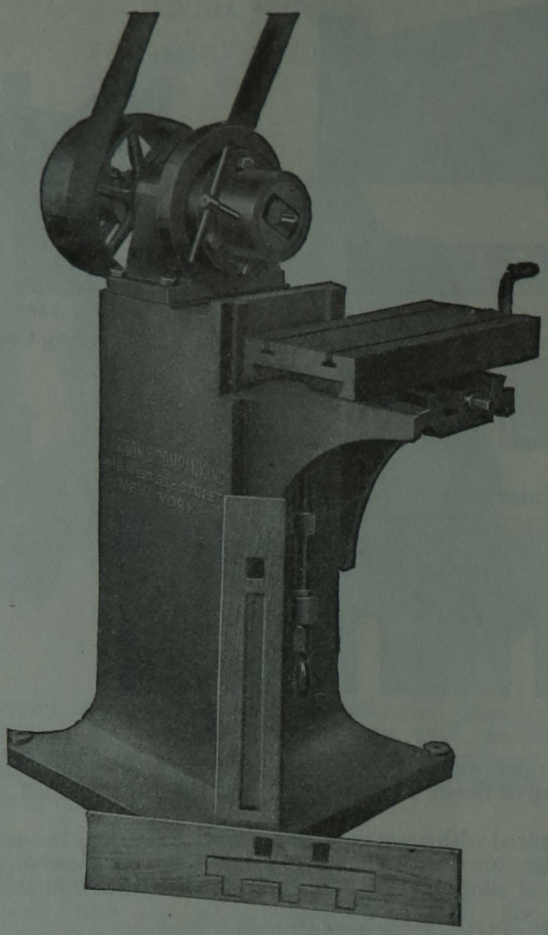


Fig. 1464

RADBORE

WOODWORKING TYPE

For all kinds of mortising and jointing, wherever a square hole or an elongated hole with square cut corners is needed. Used by manufacturers of furniture, pianos, musical instruments, airplanes, etc. By the use of this machine a true, clean and accurate square hole can be rapidly bored without splintering the wood. A blind hole can be bored and left with the bottom and corners smooth and true.

The drills have a shank in the form of a triangle, but each side is the arc of a circle. They fit into a floating driving dog in the head and are guided by a chuck with a square opening at the face of the head. The shank of the drill is always in contact at 4 points with the chuck and as the drill rotates in the stationary head the drill which is really an end mill oscillates from one contact to another and the cutting end is carried to the corners of the hole being bored. The setting up of this machine is very simple as it is only necessary to screw the proper size drill into the floating, driving dog and tighten down on the chuck until the oscillation of the drill is practically noiseless.

Drills are furnished in two models—Model A gives a fillet of radius 1/8 of the hole size and model B a fillet of radius 1/50 of the hole size. It will be seen that model B drills leave a hole with sharp corners and model A drills leave a perceptible fillet. Cutting edges are on the end so that a drill may be resharpened indefinitely without affecting its accuracy. With a machine that will turn out such work rapidly and cleanly many applications for the use of a square hole will be apparent where it has been more economical to use a round hole heretofore.

Machines are furnished complete in two sizes. Base is the same for either size.

MACHINES COMPLETE

NOS.	1W		2W	
Attachment NOS.	2	3	4	5
Range Model A Drills, Inches	1/8–9/16	1/4–7/8	1/2–1 3/8	15/16
Range Model B Drills, Inches	1/8–3/8	1/8–1/2	3/8–7/8	9/16–1 1/4
Weight Each, Complete, Lbs.	420	435	520	560
Each	$600.00	600.00	640.00	640.00

BASES ONLY

Table Adjustment, Inches	10
Cross Adjustment, Inches	5
Vertical Adjustment, Inches	7
Floor Space, Inches	22x24
Size Drive Pulley, Inches	12x3
Speed of Spindle, R.P.M.	200–300
Table Surface, Inches	6x20
Two T Slots in Table, Size, Inches	1/2

DRILLS ONLY

For No. 2 Attachment			For No. 3 Attachment			For No. 4 Attachment					For No. 5 Attachment				
Size, Ins.	Type "A" Each	Type "B" Each	Size, Ins.	Type "A" Each	Type "B" Each	Size, Ins.	Type "A" Each	Type "B" Each	Size, Ins.	Type "A" Each	Size, Ins.	Type "A" Each	Type "B" Each	Size, Ins.	Type "A" Each
1/8	$5.00	$5.00	1/4	$5.00	$5.00	3/8	.....	$6.50	15/16	$8.50	9/16	.....	$9.50	15/16	$11.00
3/16	5.00	5.00	5/16	5.00	5.00	7/16	.....	7.50	1	8.75	5/8	.....	10.50	1 3/8	11.50
1/4	5.00	5.00	3/8	5.00	5.00	1/2	$5.00	8.50	1 1/16	9.00	11/16	.....	11.50	1 7/16	12.00
5/16	5.00	6.00	7/16	5.00	6.00	9/16	6.00	9.50	1 1/8	9.25	3/4	.....	12.50	1 1/2	12.50
3/8	5.00	6.50	1/2	5.00	6.50	5/8	6.50	10.50	1 3/16	9.50	13/16	.....	13.50	1 9/16	13.00
7/16	5.00	.....	9/16	6.00	7.50	11/16	7.00	11.50	1 1/4	9.75	7/8	.....	14.50	1 5/8	14.00
1/2	5.00	.....	5/8	6.50	8.50	3/4	7.50	12.50	1 5/16	10.00	15/16	$9.00	15.50	1 11/16	15.00
9/16	6.00	.....	11/16	7.00	.....	13/16	8.00	13.50	1 3/8	10.25	1	9.25	16.50	1 3/4	16.00
.....	.....	.....	3/4	7.50	.....	7/8	8.25	14.50	.....	.....	1 1/16	9.50	17.50	1 13/16	17.00
.....	.....	.....	13/16	8.00	.....	.....	.....	.....	.....	.....	1 1/8	9.75	18.50	1 7/8	18.00
.....	.....	.....	7/8	8.25	.....	.....	.....	.....	.....	.....	1 3/16	10.00	19.50	1 15/16	19.00
											1 1/4	10.50	20.00	2	20.00

BOARD RULES

Fig. 1465

SPRING STEEL

Made of best quality tempered spring steel. Will bend to the board and return exactly straight when released. Provided with hand fitting wood handle and with leather slide for handling the rule at any part of the blade. The head is of steel. The rule is nickel plated and lacquered to prevent rusting and has frosted surface; the figures are large and black and the divisions are marked with distinct black dots.

NOS.	51	52	52½
Type	Inspectors	Board	Sorting
Tiers	3	3	3
Size, Feet	3½	3	2½
Width, Inch	1	1	1
Weight per Dozen, Lbs.	15	15	15
Per Dozen	**$42.00**	**36.00**	**33.00**
Marked One Side to Measure		8, 10 and 18 Feet	
Marked Opposite Side to Measure		12, 14, 16 or 18, 20, and 22 Feet	

When ordering, state measure of rule wanted. Can be furnished with diamond head, if so wanted, at same price.

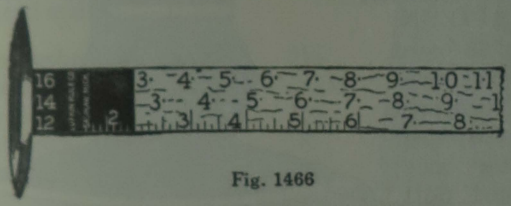


Fig. 1466

HICKORY—BURNT FIGURES

Diamond shaped top or cap of best tempered steel, brazed to an extra heavy brass shoulder. Rule made of best selected second-growth white hickory. Can be furnished with half foot marks indicated by dots at an additional charge. Can be furnished with diamond head at same price.

NOS.	1	2	2N	3
Type	Inspectors	Board	Narrow Board	Sorting
Tiers	3	3	3	3
Width, Inches	1⅛	1⅛	⅞ or 1	1⅛
Figured, Inches	36	30	30	24
Length Handle, Ins.	6	6	6	6
Length Over All, Ins.	42	36	36	30
Wgt. per Dozen, Lbs.	7½	6	5¼	6
Per Dozen	**$27.00**	**25.00**	**25.00**	**24.00**

Marked on one side to measure 12, 14 and 16 feet; opposite side, 8, 10 and 18 or 12, 20 and 22 feet. State which is wanted, when ordering.

LOG RULES

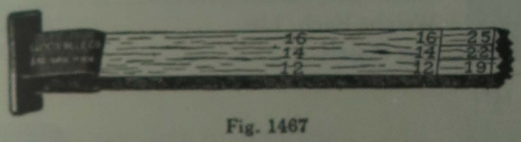


Fig. 1467

HICKORY—SQUARE HEAD—BURNT FIGURES

Made with Doyle, Scribner, Decimal and combined Doyle Scribner. Other scales and rules for any diameter or length measurement can be furnished at extra price. Rules are marked 8 to 20 feet or 12 to 24 feet. State which is wanted, when ordering.

NOS.	14	15
Figured, Inches	48	36
Length Handle, Inches	8	6
Length Over All, Inches	56	42
Weight per Dozen, Lbs.	10½	8¼
Per Dozen	**$27.00**	**23.00**

LOG RULES

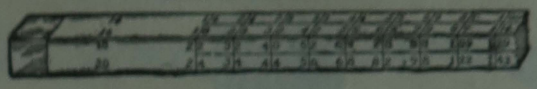


Fig. 1468

HICKORY—SQUARE RULE—BURNT FIGURES

Made with Doyle, Scribner, Decimal and combined Doyle-Scribner scales. All other scales are special. Regular rules are marked to scale even length logs from 18 to 20 feet or 12 to 24 feet. Rules for any diameter or length measurement can be furnished at extra cost. When ordering, state length of rule wanted.

NOS.	24	23
Size Rule, Inch	1	1
Tiers, Each Side	2	2
Figured, Inches	48	48
Weight per Dozen, Lbs.	17	15
Per Dozen	**$30.00**	**24.00**

LOG CALIPERS

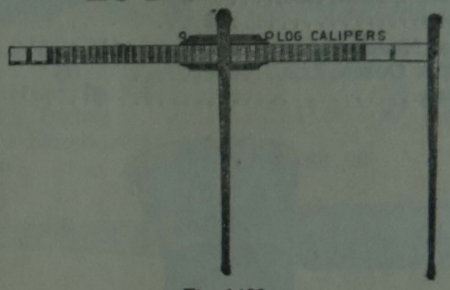


Fig. 1469

MAPLE—SLIDING JAW—BURNT FIGURES

Measures the diameter and scales the number of feet board measure in log. Beam is made of maple; jaws of maple, brass tipped. Made with any log scale desired. Regularly figured to measure logs up to 48 inches in diameter, without more than 8 tiers of figures. When ordering, state scale wanted and length of logs to be measured.

	Each
NO. 25—Length Sliding Jaw, 26 Inches; Weight Each, 3¼ Lbs.	$8.00

LUMBER GAUGES

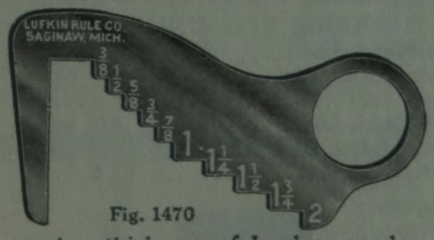


Fig. 1470

For measuring thickness of lumber; made of finished aluminum, very light and convenient.

	Per Dozen
NO. 0—Measures 1, 1¼, 1½, 1¾, 2 Inches; Weight per Dozen, 9 Ounces	$6.00
NO. 00—Measures ⅜, ½, ⅝, ¾, ⅞, 1, 1¼, 1½, 1¾, 2 Inches; Weight per Dozen, 9 Ounces	6.00
NO. 000—Measures ⅝, ¾, 1, 1¼, 2, 2½ Inches; Weight per Dozen, 12 Ounces	6.50

MARKING STICKS

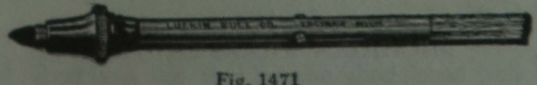


Fig. 1471

Made to hold lumber crayons firmly in place; nickel plated finish.

	Per Dozen
NO. 0—Marking Stick; Length Handle, 36 Inches; Weight per Dozen, 7½ Lbs.	$20.00
NO. 0A—Holders Only; Weight per Dozen, 2¼ Lbs.	16.00

AXES

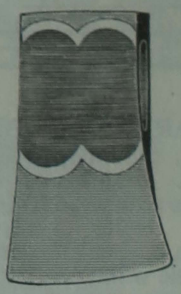


Fig. 1472

YANKEE PATTERN

Soft steel body; hardened poll; crucible forged steel, tempered bit; gold bronze polished head and bit.

SINGLE BIT—UNHANDLED

Weight of Head, Lbs.	3 to 4	3½ to 4½	4 to 5
Weight per Dozen, Lbs.	48	54	60
Per Dozen	$....	....	....
Weight of Head, Lbs.		**4½ to 5½**	**5 to 6**
Weight per Dozen, Lbs.		66	73
Per Dozen		$....	....

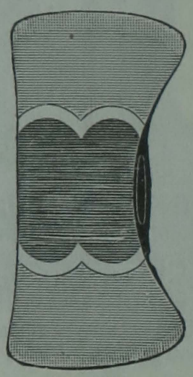


Fig. 1473

MICHIGAN PATTERN

Soft steel body; hardened poll; crucible forged steel, tempered bits, gold bronze polished bits.

DOUBLE BIT—UNHANDLED

Weight of Head, Lbs.	3 to 4	3½ to 4½	4 to 5
Weight per Dozen, Lbs.	48	54	60
Per Dozen	$....	....	....
Weight of Head, Lbs.		**4½ to 5½**	**5 to 6**
Weight per Dozen, Lbs.		66	73
Per Dozen		$....	....

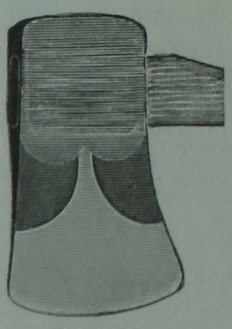


Fig. 1474

MICHIGAN RIDGE PATTERN

Hollow bevel; body painted red; soft steel body; hardened poll, crucible forged steel and tempered bit polished.

SINGLE BIT—HANDLED

Weight of Head, Lbs.	**3½ to 4½**
Weight per Dozen, Lbs.	75
Per Dozen	$....

Prices on Application

BROAD AXES

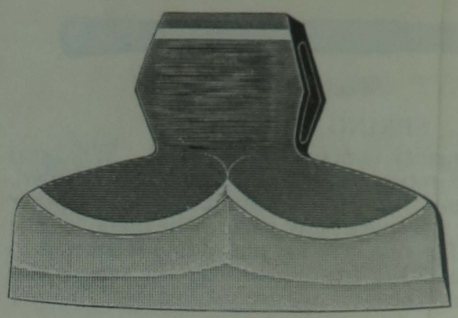


Fig. 1475

CANADA PATTERN

Soft steel body; hardened poll; special crucible forged steel laid bit, carefully tempered; gold bronze finish; polished bit.

Weight Assorted, Lbs.	5 to 7	6 to 7, 6½ to 7½	
	All 6	All 6½ and 7	
Per Dozen	$42.00	44.00	
Weight Assorted, Lbs.	7 to 8, 7½ to 8½, 7 to 9	8 to 9	
	All 7½ and 8	All 8½ and 9	
Per Dozen	$46.00	48.00	
Weight Assorted, Lbs.	9 to 11	10 to 11	
	All 9½ and 10	All 11	
Per Dozen	$50.00	54.00	

PENNSYLVANIA PATTERN

Crucible forged steel bit; carefully tempered and sharpened; soft steel body; hardened poll. Polished head and bit; gold bronzed body.

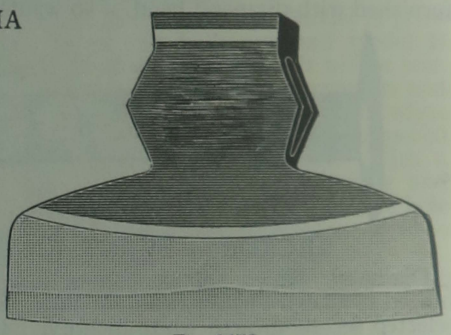


Fig. 1476

Weight Assorted, Lbs.	5 to 6½, 6 to 7½	7 to 8, 7½ to 8½	
	6½ to 7½, 6 to 8	7 to 9	
	All 5 and 5½	All 6, 6½, 7½ and 8	
Per Dozen	$32.00	35.00	
Weight Assorted, Lbs.	8 to 9, 8½ to 9½, 8 to 10		
	All 8½, 9, 9½ and 10		
Per Dozen	$38.00		

SAW WEDGES

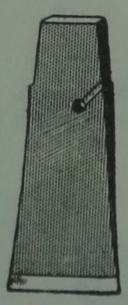


Fig. 1477

IMPROVED PATTERN

Forged Steel, Oil Finish

Length, Inches	9¼
Size Head, Inches	1⅜x½
Width Bit, Inches	3⅜
Weight Each, Lbs.	2½
Per Pound	$0.30

COMMON PATTERN

Forged Steel, Oil Finish

Length, Inches	9½
Size Head, Inches	3x3⅜
Width Bit, Inches	3
Weight Each, Lbs.	2½
Per Pound	$0.25

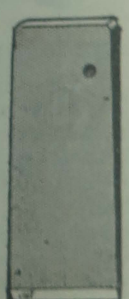


Fig. 1478

WOOD CHOPPERS' WEDGES

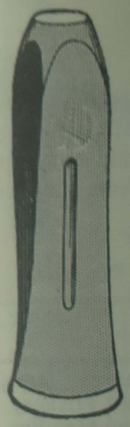


Fig. 1479

TRUCKEE PATTERN

Solid cast steel; oil finished, hardened head and flared bit.

Length, Inches	**11⅛**	**11¾**
Size Head, Inches	1½	1⅝
Width Bit, Inches	1⅞	2¼
Weight Each, Lbs.	6	8
Per Pound	**$0.36**	**.36**

STAVE WEDGE

Solid cast steel; oil finished, hardened head and bit.

Length, Inches	**8**	**9¼**
Size Head, Inches	2x1⅜	2¼x1⅞
Width Bit, Inches	3½	4½
Weight Each, Lbs.	4	8
Per Pound	**$0.25**	**.25**

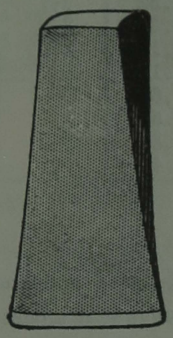


Fig. 1480

WOOD CHOPPERS' MAULS

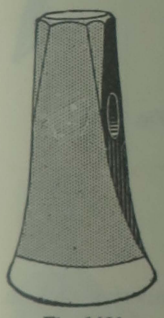


Fig. 1481

OREGON PATTERN

Solid cast tool steel, oil finish; hardened and polished faces; tempered and sharpened flared bit.

Length, Inches	**8⅛**	**8¾**	**9½**
Size Head, Inches	1⅞	2⅛	2¼
Width Bit, Inches	4	4¼	4½
Weight Each, Lbs.	6	8	10
Per Pound	**$0.36**	**.36**	**.36**

STRAIGHT BIT PATTERN

Solid cast tool steel, oil finish; hardened and polished faces, tempered and sharpened bit.

Length, Inches	**7¾**	**8½**	**9**
Size Head, Inches	2	2⅛	2⅜
Width Bit, Inches	2	2⅛	2½
Weight Each, Lbs.	6	8	10
Per Pound	**$0.36**	**.36**	**.36**

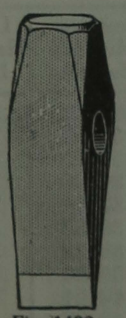


Fig. 1482

LUMBERING TOOLS

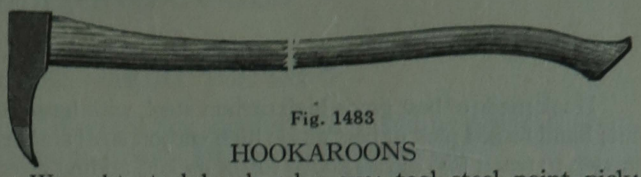


Fig. 1483

HOOKAROONS

Wrought steel head; adze eye; tool steel point pick; blued finish; ¾ inch No. 1 Hickory Axe Handle.

NOS.	**421**	**422**
Kind	Light	Heavy
Height of Head, Inches	¼	1
Size of Pick, Inches	1¾x1⅛x7	1¾x1⅛x8
Weight per Dozen, Lbs.	28	36
Per Dozen	**$13.00**	**16.45**

One-half Dozen in a Crate

Fig. 1484

HOOKAROON HEADS

Wrought steel head; axe eye; tool steel point pick; blued finish.

NOS.	**599**	**598**
Kind	Light	Heavy
Height of Head, Inches	¼	1
Size of Pick, Inches	1¾x1⅛x7	1¾x1⅛x8
Weight per Dozen, Lbs.	24	18½
Per Dozen	**$8.00**	**11.65**

Fig. 1485

PIKE POLES

Seamless steel ferrule; worm point, straight pike and curved hook in one piece; diameter socket, 1 inch; ash handle.

NOS.	**407**	**408**	**409**	**410**
Size of Pike, Inches	½x3½	½x3½	½x3½	½x3½
Size Hook, Inches	½x2½	½x2½	½x2½	½x2½
Length Handle, Feet	12	14	16	18
Weight per Dozen, Lbs.	45	106	116	126
Per Dozen	**$23.75**	**28.50**	**35.00**	**45.00**

PIKE POLES AND HOOKS

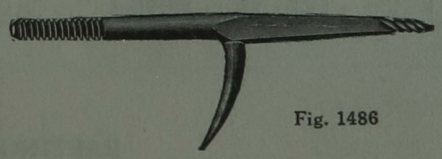


Fig. 1486

Forged Steel; threaded shank; straight worm point pike and curved hook in one piece.

NO. 594—Length Over All, 11 Inches; ½x3½ Inch Pike; ½x2½ Inch Hook, Weight per Dozen, 13½ Lbs. **$10.00**

PIKE POLE PIKES

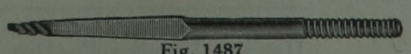


Fig. 1487

Forged steel threaded shank; japanned.

Per Dozen

NO. 596—Length, 12¾ Inches; Diameter, ⅝ Inch; Weight per Dozen, 8 Lbs. **$6.25**

PIKE POLE FERRULES

Fig. 1488

Per Dozen

NO. 597—Length, 5 Inches; Diameter, 1 Inch; Weight per Dozen, 12 Lbs. **$4.50**

LUMBERING TOOLS

PEAVIES

Hook made of best grade high carbon steel, with heavy upset head, fastened with square head steel bolt with hexagon nut; hand forged pick of best grade high carbon steel and driven in cold with cement to secure it more firmly; made long enough to reach two inches above top of socket, adding greatly to strength of tool at point where greatest strain comes in actual use. Stock turned from best second growth white maple and hickory, straight grained, free from defects and air-seasoned.

Malleable iron solid socket; duckbill, round or diamond head hooks

When ordering, specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

Fig. 1489

Diam. Handles, Inches	Length Handles, Feet	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles	Diam. Handles, Inches	Length Handles, Inches	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles
2	2½	80	$26.88	$30.80	2¾	4	135	$34.72	$37.10
2	3	85	27.44	31.50	2¾	4½	140	35.56	39.76
2	3½	95	28.00	31.92	2¾	5	145	36.40	40.74
2¼	4	110	28.56	33.04	2¾	5½	150	37.24	42.00
2¼	4½	120	29.40	34.16	2¾	6	155	38.08	42.84
2¼	5	125	30.24	35.14	3	....	145	40.04	43.54
2½	4	115	30.10	33.60	3	....	150	41.16	45.08
2½	4½	120	30.80	34.58	3	....	155	41.72	46.20
2½	5	125	31.78	35.56	3	....	160	42.56	47.32
2½	5½	130	32.62	36.40	....	....	....	....	.....

Wrought steel socket and clasp; duckbill, round or diamond head hooks

When ordering, specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

Diam. Handles, Inches	Length Handles, Feet	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles	Diam. Handles, Inches	Length Handles, Feet	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles
2¼	2½	75	$31.64	$33.74	2¾	4	123	$38.92	$42.28
2¼	3	80	32.34	34.44	2¾	4½	127	40.88	43.40
2¼	3½	90	33.04	35.14	2¾	5	132	42.00	44.24
2¼	4	108	34.58	35.98	2¾	5½	137	42.98	44.80
2¼	4½	113	35.00	36.82	2¾	6	142	43.96	45.64
2¼	5	118	36.40	37.66	3	4½	135	44.80	47.88
2½	4	113	35.28	37.52	3	5	140	46.20	49.28
2½	4½	118	36.40	38.22	3	5½	145	47.32	49.98
2½	5	123	37.38	39.20	3	6	150	48.30	50.68
2½	5½	129	38.22	39.76					

Fig. 1490

RAFTING PEAVIES

Adapted for rafting, river log driving, etc. Wrought steel, tapering solid socket and square tapering pick in one piece; clasp with duckbill, round or diamond head hooks.

When ordering, specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

Fig. 1491

Diam. Handles, Inches	Length Handles, Feet	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles	Diam. Handles, Inches	Length Handles, Feet	Weight Per Doz., Lbs.	Per Doz., Maple Handles	Per Doz., Hickory Handles
2¼	2½	75	$32.48	$34.72	2¾	4	118	$40.88	$43.40
2¼	3	80	33.18	35.42	2¾	4½	123	42.00	44.52
2¼	3½	85	33.88	36.12	2¾	5	128	42.84	45.36
2¼	4	90	35.00	36.96	2¾	5½	133	43.68	46.20
2¼	4½	95	35.98	37.80	2¾	6	138	44.80	47.04
2¼	5	100	36.96	38.36	3	4½	133	46.20	49.28
2½	4	110	35.98	38.22	3	5	138	47.18	50.40
2½	4½	115	36.96	39.20	3	5½	143	48.30	51.24
2½	5	122	37.94	40.04	3	6	148	49.28	52.08
2½	5½	127	39.06	40.88					

LUMBERING TOOLS

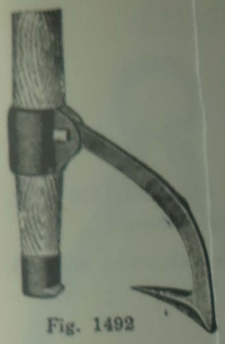


Fig. 1492

CANT HOOKS—SHORT TOE RING

Malleable iron clasp, with steel forged short toe ring and duckbill, round or diamond hooks. Handled with selected white maple or hickory, straight grained and air seasoned.

When ordering, specify kind of hook wanted. Duckbill hooks always sent unless otherwise ordered.

Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles	Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles
2	2½	63	$22.26	$25.34	2¾	4½	93	$29.40	$30.80
2	3	68	22.96	26.04	2¾	5	98	30.24	23.88
2	3½	73	23.24	26.88	2¾	5½	103	31.08	35.00
2¼	4	78	24.22	27.44	2¾	6	108	31.92	35.70
2¼	4½	83	24.92	28.28	3	4½	98	36.26	39.90
2½	4	83	24.64	28.00	3	5	103	37.52	42.28
2½	4½	88	25.20	38.70	3	5½	108	38.36	42.84
2½	5	93	26.04	29.82	3	6	113	39.48	44.10
2½	5½	98	27.02	20.80					

CANT HOOK—EXTENSION TOE RING

Fig. 1493

Malleable iron clasp and extension toe ring, with duckbill, round or diamond head hooks, best selected white maple or hickory handles, straight grained and air seasoned.

When ordering, specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles	Diameter Handles Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles
2	2	73	$22.26	$25.34	2½	5½	105	$27.02	$30.80
2	3½	78	22.96	26.04	2¾	4½	105	29.40	30.80
2	3½	83	23.24	26.88	2¾	5	110	30.74	33.88
2¼	4	88	24.22	27.44	2¾	5½	115	31.08	35.00
2¼	4½	93	24.92	28.28	2¾	6	120	31.92	35.70
2½	4	90	24.64	28.00	3	4½	120	36.26	39.90
2½	4½	95	25.20	28.70	3	5	125	37.52	42.28
2½	5	100	26.04	29.82	3	5½	130	38.36	42.84
					3	6	135	39.48	44.10

Fig. 1494

CANT HOOKS—CHISEL POINT

Malleable iron clasp, chisel point, short toe ring; handled with second growth white maple or hickory, well seasoned.

Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles	Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles
2½	4	82	$23.38	$27.16	2¾	5½	102	$29.96	$34.72
2½	4½	87	24.08	28.00	2¾	6	107	30.80	35.56
2½	5	92	24.92	28.56	3	4½	97	35.00	39.76
2½	5½	97	26.04	29.40	3	5	102	36.70	42.00
2¾	4½	92	28.28	33.04	3	5½	107	37.52	42.84
2¾	5	97	29.12	33.60	3	6	112	38.50	43.82

Fig. 1495

LUMBERING TOOLS

CANT HOOKS—EXTENSION TOE RING

Wrought steel clasp, duckbill, round or diamond head hooks, and extension toe ring. Handled with second growth white maple or hickory, straight grained and air seasoned.

When ordering specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles	Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles
2½	4½	85	$27.72	$31.64	2¾	5½	105	$33.60	$37.24
2½	5	90	28.56	32.34	2¾	6	110	34.44	38.08
2½	5½	95	29.40	33.18	3	4½	110	38.64	42.28
2¾	4½	95	31.92	35.56	3	5	115	40.32	44.80
2¾	5	100	32.76	36.40	3	5½	120	41.16	45.36
					3	6	125	42.00	46.34

CANT HOOKS—SHORT TOE RING

Wrought steel clasp, duckbill, round or diamond head hooks, and short toe ring. Handled with second growth white maple or hickory, straight grained and air seasoned.

When ordering specify kind of hook wanted. Duckbill always sent unless otherwise ordered.

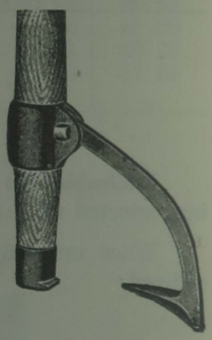


Fig. 1496

Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles	Diameter Handles, Inches	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	Per Dozen, Hickory Handles
2½	4½	85	$27.72	$31.64	2¾	5½	105	$33.60	$37.24
2½	5	90	28.56	32.34	2¾	6	110	34.44	38.08
2½	5½	95	29.40	33.18	3	4½	110	38.64	42.28
2¾	4½	95	31.92	35.56	3	5	115	40.32	44.80
2¾	5	100	32.76	36.40	3	5½	120	41.16	45.36
					3	6	125	42.00	46.34

TIMBER CARRIERS

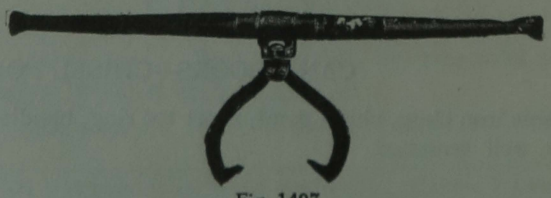


Fig. 1497

High carbon steel chisel point hooks; japanned malleable iron clasp; steel swivel bolt; best second growth maple or hickory handles; for handling ties, telegraph poles, timbers, etc.; grapple anything from 3 to 16 inches, and are fitted with swivel to permit carrying timber through narrow passageways.

NOS.	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Maple Handles	NOS.	Length Handles, Feet	Weight Per Dozen, Lbs.	Per Dozen, Hickory Handles
608	4	87	$28.98	608A	4	92	$32.48
609	4½	92	29.40	609B	4½	97	33.32
610	5	98	30.24	610C	5	103	33.38

LUMBERING TOOLS

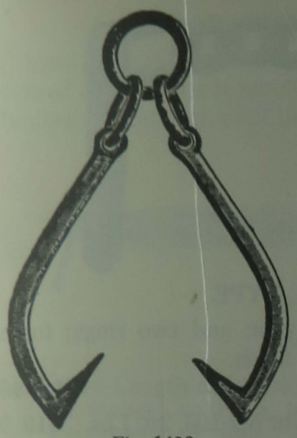


Fig. 1498

LOG GRAPPLE HOOKS

Tongs made of high carbon steel, hand forged with heavy upset heads; soft steel rings; used for drawing or raising logs and poles in the woods.

NOS.	Size Octagon Steel, Inches	Weight Per Dozen, Lbs.	Per Dozen
190-A	¾	120	$28.90
190-B	⅞	144	30.90
190-C	1	180	33.00
191	1⅛	204	37.00
192	1¼	425	43.00

SKIDDING TONGS

Made of best high carbon steel, hand forged and with heavy upset head, plain swivel and grab hook, used for drawing logs and poles up to the skidway, etc.

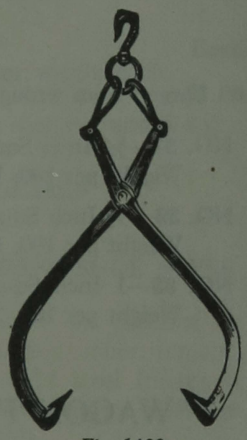


Fig. 1499

Per Dozen

NO. 148—Flat Steel, 1½x⅝ Inches; Opens 32 Inches; Weight per Dozen, 240 Lbs. $62.15
NO. 145—Octagon Steel, 1 Inch; Opens 24 Inches; Weight per Dozen, 240 Lbs. 55.90
NO. 146—Octagon Steel, 1⅛ Inches; Opens 32 Inches; Weight per Dozen, 268 Lbs. 62.15
NO. 147—Octagon Steel, 1¼ Inches; Opens 36 Inches; Weight per Dozen, 360 Lbs. 74.50

Fig. 1500

GRIP HOOKS

For steam log loaders. Will not tear out, releases easily. Made of Vanadium steel and very light.

Per Pair

NO. 0—For Small Logs ..... $.....
NO. 1—For Average Logs .....
NO. 2—For Extra Large Logs .....

Note.—No. 1 size extensively used in Yellow Pine Belt and for light hardwood and unless otherwise specified will be sent.

Prices on Application

LUMBERING TOOLS

Fig. 1501

SWAMP HOOKS

Hooks are hand forged from best high carbon steel with heavy upset head. Grab hooks and rings are of soft steel. Furnished made from octagon, square, or flat steel with round points. Illustration shows flat steel hook.

Per Dozen

NO. 129—1 Inch Octagon Steel, Weight per Dozen, 65 Lbs. $20.52
NO. 130—1⅛ Inch Octagon Steel; Weight per Dozen, 80 Lbs. 22.20
NO. 131—1¼ Inch Octagon Steel; Weight per Dozen, 110 Lbs. 25.60
NO. 132—1 Inch Square Steel; Weight per Dozen, 65 Lbs 20.52
NO. 135—1¼x⅝ Inch Flat Steel; Weight per Dozen, 70 Lbs. 20.52

LOADING HOOKS

Hand forged hooks; made of best high carbon steel; upset points heavy and strong; for loading sleds, wagons, cars, etc.

Fig. 1502

Per Dozen

NO. 138—¾ Inch Square Steel; Weight per Dozen, 27 Lbs. $12.00
NO. 139—¾ Inch Octagon Steel; Weight per dozen, 30 Lbs. 12.00
NO. 140—1x½ Inch Flat Steel; Weight per Dozen, 30 Lbs. 10.30

Fig. 1503

ROLLWAY BREAKING HOOKS

Hand forged hooks, made of best high carbon steel; upset points, heavy and strong; rings of soft steel.

NO. 141—1½x⅝ Inch; Weight per Dozen, 45 Lbs. .. $27.40

LUMBERING TOOLS

SAFETY LOADING HOOKS

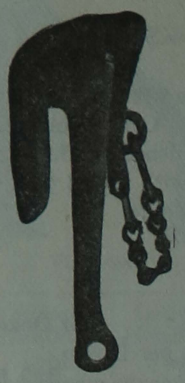


Fig. 1504

This safety fid hook is simple and easy to operate. It is only necessary to lock the hook and fasten load exactly as would be done with the old-fashioned fid hook; safety device on it comes into play when getting ready to release load. In experimenting and in actual logging work this hook has never become jammed so that it would fail to work. No load has ever shifted or spread in such a manner as to prevent hook from responding promptly to pull of the snatching chain when it was desired to unload the logs.

On the other hand, the more strain there is on wrapper chain and hook, the better it holds.

To release load, unlock hook, attach snatching chain to trip on hook, get back safely out of way and give a sharp pull. Hook then opens and releases wrapper chain, allowing logs to roll off freely without loss of time or loss of life or limb.

Each

NO. 1—Weight Each, 2¾ Lbs ..... $....

Price on Application

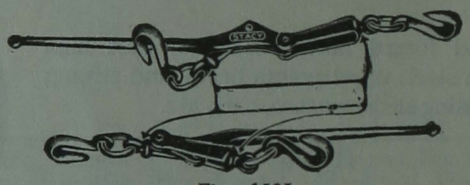


Fig. 1505

LOG OR LOAD BINDERS

Binds equally successfully lumber, ties, logs, timbers, mixed lumber, boilers, pipes, poles; in fact any load which requires binding with a chain. Fits any chain from ¼ to ½ inch, is easily applied and is a great time saver for the teamster. Saves its cost many times in a year, with absolutely no danger of accident.

Per Pair

NO. 1—Malleable Iron Throughout, Will Take up About 4½ Inch of Slack; Weight per Pair, 21 Lbs..... $....

Price on Application

Fig. 1506

CORNER BIND HOOKS

Drop forged, oval steel, self-colored.

Per Dozen

NO. 18.—½x1¼ Inches; Weight per Dozen, 24 Lbs..... $5.10

RAFTING DOGS

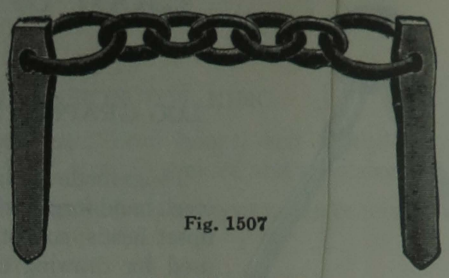


Fig. 1507

CHAIN TYPE

Made with five links of chain and two rings; forged from wrought iron, natural finish.

Per 100

NO. 30—1⅛x¾ Inches, Weight per 100, 240 Lbs...$19.00

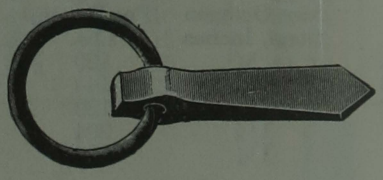


Fig. 1508

RING TYPE

Forged from wrought iron, natural finish.

Per 100

NO. 31—¾ Inch Square Iron, with 2 Inch Ring; Weight per 100, 125 Lbs.....$13.00

NO. 32—⅞ Inch Square Iron, with 2½ Inch Ring; Weight per 100, 160 Lbs..... 15.20

NO. 33—1 Inch Square Iron, with 3 Inch Ring; Weight per 100, 210 Lbs..... 17.30

WAGON FIFTH OR ROLLING CHAINS

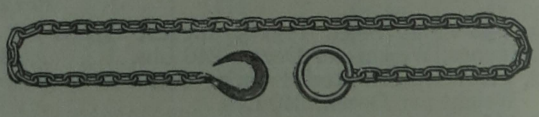


Fig. 1509

Polished, wrought iron welded; round hook on one end, and ring on other end; made in ¼, 5/16 and ⅜ inch sizes, any length desired.

Prices on Application

RAFTING CHAINS

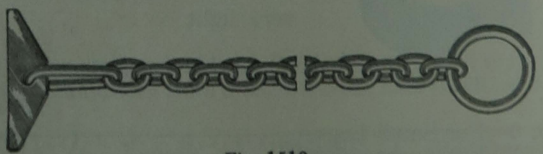


Fig. 1510

Self-colored, wrought iron welded, made in any size and length desired.

Note.—Prices on application, giving size, style, quality and quantity desired.

LUMBERING TOOLS

CAR DOOR ROLLERS

Used by lumber handlers; is secured in door on either side of car, making it much easier to load car by shoving lumber or timber in over the roller, made of hardwood.

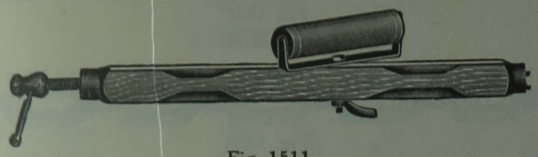


Fig. 1511

Side Door

	Each
NO. 659—Length of bar, 4½ feet; length of screw, 16 inches; roller is about 18 inches wide; weight each, 38 lbs.	$9.00

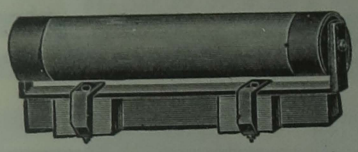


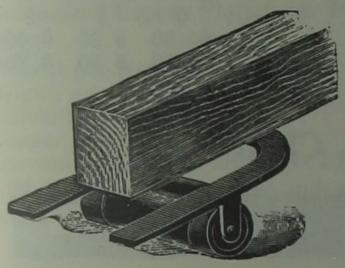
Fig. 1512

End Door

	Each
NO. 659½—Width of roller,18 inches; weight each, 12 lbs.	$5.00

Note.—Extra long bars, 50 cents each net additional.

TIMBER DOLLIES



HORSE SHOE STYLE

Used for shifting or swinging timber, iron,etc.; wrought steel frame; ⅜ x2 inch shoe; ½x2 inch saddle.

Fig. 1513

	Each
NO. 646—Rock Maple roller, 4x14 Inches; weight each, 14 Lbs.	$5.00
NO. 647—Cast iron roller, 6x14 Inches; weight each, 41 Lbs.	6.75

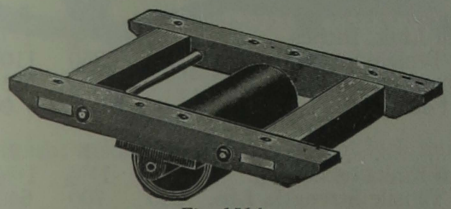


Fig. 1514

For handling timber, rails, structural steel, etc.; extra heavy mortised and bolted hardwood frame; japanned malleable iron axle bracket; wrought steel axle; can be used as a truck, or inverted as a roller.

NO.	282-2
Size Frame, Inches	26x19¼x7¾
Size Rails, Inches	3¼x3¾
Size Roller, Inches	12x6
Weight Each, Lbs.	70
Each	$9.50

CAR BRAKE CHAINS

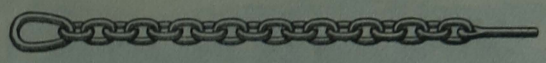


Fig. 1515

Self colored, welded wrought iron; made in ⅜, 7/16 and ½ inch sizes, with or without eyebolts or end links; also with double eyebolt or double end links.

RAILROAD SWITCH OR LOG CHAINS

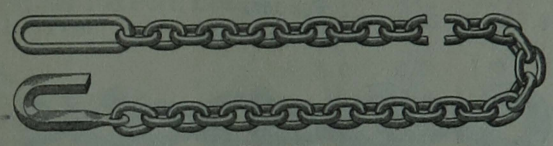


Fig. 1516

Self colored, welded wrought iron; made in ¾ to 1 inch sizes. Standard length, 13 feet. Grab hook on one end, long link on other end. Made any length desired.

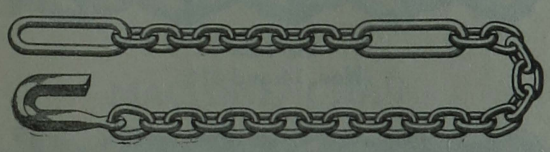


Fig. 1517

Self colored, welded wrought iron; made in ¾ to 1 inch sizes. Standard length, 13 feet. Grab hook on one end, and two long links on chain. Made any length desired.

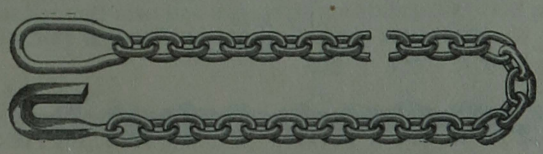


Fig. 1518

Self colored, welded wrought iron; made in ¾ to 1 inch sizes. Standard length, 13 feet. Grab hook on one end, and special shape long link on other end. Made any length desired.

LOG OR BINDING CHAINS

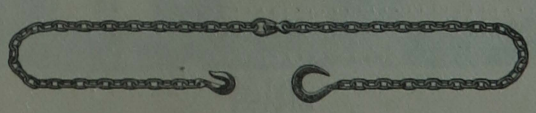


Fig. 1519

Self colored, welded wrought iron; malleable swivel with one round hook and one grab hook. Made in ¼, 5/16, ⅜, 7/16, ½ and ⅝ inch sizes; regular lengths, 12, 14 and 16 feet.

Note.—All above chains, prices on application; give size, style, quality and quantity desired when ordering.

SINGLE JACK CHAIN

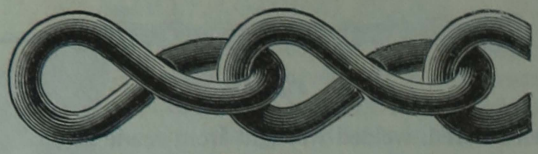


Fig. 1520
Nos. 8 and 108

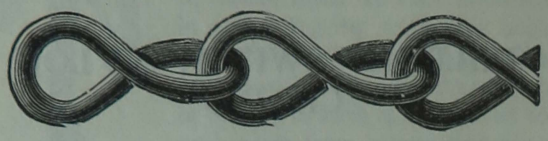


Fig. 1521
Nos. 10 and 110

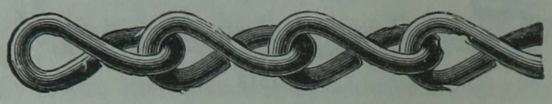


Fig. 1522
Nos. 12 and 112

Fig. 1523
Nos. 14 and 114

Fig. 1524
Nos. 16 and 116

Fig. 1525
Nos. 18 and 118

Fig. 1526
Nos. 20 and 120

IRON

NOS.	8	9	10
Weight per Dozen Yards, Lbs.	6½	4	3 1/16
Per Dozen Yards	$0.95	.90	.80

NOS.	11	12	13	14
Weight per Dozen Yards, Lbs.	2 3/8	2 3/16	1 7/8	1 3/4
Per Dozen Yards	$0.70	.65	.60	.55

NOS.	15	16	18	20
Weight per Dozen Yards, Lbs.	1 1/8	1	3/8	1/4
Per Dozen Yards	$0.50	.48	.45	.40

BRASS

NOS.	108	109	110
Weight per Dozen Yards, Lbs.	6½	4	3 1/16
Per Dozen Yards	$5.25	4.25	3.50

NOS.	111	112	113	114
Weight per Dozen Yards, Lbs.	2 3/8	2 3/16	1 7/8	1 3/4
Per Dozen Yards	$2.80	2.30	1.92	1.60

NOS.	115	116	118	120
Weight per Dozen Yards, Lbs.	1 1/8	1	3/8	1/4
Per Dozen Yards	$1.25	1.00	.70	.55

SAFETY CHAIN

BRASS AND NICKEL PLATED

Cuts Full Size

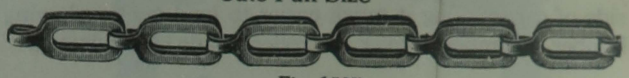


Fig. 1527
No. 3/0

Fig. 1528
No. 2/0

Fig. 1529
No. 0

Fig. 1530
No. 1

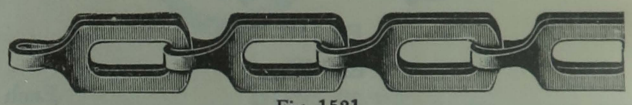


Fig. 1531
No. 2

NOS.	3/0	2/0
Per 100 Feet, Brass	$3.30	3.60
Per 100 Feet, Nickeled	3.40	3.70

NOS.	0	1	2
Per 100 Feet, Brass	$4.30	5.20	6.40
Per 100 Feet, Nickeled	4.50	5.50	6.70

COIL CHAIN

Fig. 1532

AMERICAN

Bright finish; made of high grade flat steel; weldless links.

NOS.	4/0	3/0	2/0
Length of Link, Inches	1 27/32	1 27/32	1 23/32
Approx. Tensile Strength, Lbs.	1350	1100	1000
Weight per 100 Feet, Lbs.	21½	16½	15½
Per 100 Feet	$6.50	5.00	4.40

NOS.	0	1	2	3
Length of Link, Inches	1 22/32	1 15/32	1 15/32	1 9/32
Approx. Tensile Strength, Lbs.	800	700	640	500
Weight per 100 Feet, Lbs.	12¾	11¼	8¼	7½
Per 100 Feet	$3.75	3.50	3.15	2.90

NOS.	4	5	6	7
Length of Link, Inches	....	....	....	....
Approx. Tensile Strength, Lbs.	450	400	380	275
Weight per 100 Feet, Lbs.	6⅓	5¾	4½	3¼
Per 100 Feet	$2.70	2.50	2.30	2.20

NOS.	8	9½	112	113
Length of Link, Inches	3/4	21/32	29/32	29/32
Approx. Tensile Strength, Lbs.	240	175	650	850
Weight per 100 Feet, Lbs.	3½	1¾	10½	12½
Per 100 Feet	$2.10	2.00	4.00	4.50

COIL CHAIN

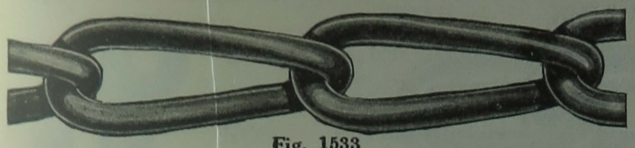


Fig. 1533

LIBERTY

Twisted link; bright wrought steel.

NOS.	8/0	7/0	6/0	5/0	4/0
W & M Gauge	11/32	5/16	9/32	1/4	7/32
Links per Foot	7½	8	8½	8½	8½
Weight per 100 Ft., Lbs.	85	70	52	46	36
Per 100 Feet	**$25.00**	**21.00**	**18.00**	**15.50**	**13.00**

NOS.	3/0	2/0	1/0	1	2	3
W & M Gauge	5	6	7	8	9	10
Links per Foot	9	9	9	9	9	9½
Weight per 100 Ft., Lbs.	32	27	23	19	13	11
Per 100 Feet	**$11.00**	**10.00**	**8.80**	**7.80**	**7.20**	**6.80**

SASH CHAIN

Fig. 1534

Bright finish; made of high-grade flat steel; weldless links.

NOS.	80	100
Weight per Reel 500 Feet, Lbs.	31	34
Bright, per 100 Feet	**$**	
Galvanized, per 100 Feet		
Copper Plated, per 100 Feet		
Galvanized Copper Plated, per 100 feet		

NOS.	130	250
Weight per Reel 500 Feet, Lbs.	38	48
Bright, per 100 Feet	**$**	
Galvanized, per 100 Feet		
Copper Plated, per 100 Feet		
Galvanized Copper Plated, per 100 Feet		

Note.—Numbers correspond with weight of sash which pair of chains will carry.

Prices on Application

COIL CHAIN

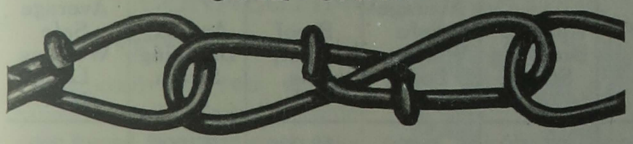


Fig. 1535

NIAGARA

Bright finish; weldless steel wire; patent lock links.

NOS.	4/0	3/0	2/0	0
Gauge, Nos.	8	9	10	11
Approx. Tensile Strength, Lbs.	2100	1593	1303	1095
Weight per 100 Feet, Lbs.	24	21	17½	13¼
Per 100 Feet	**$3.75**	**3.25**	**2.50**	**2.30**

NOS.	1	2	3	4
Gauge, Nos.	12	13	13½	14
Approx. Tensile Strength, Lbs.	850	700	600	540
Weight per 100 Feet, Lbs.	10½	7¾	6¾	6
Per 100 Feet	**$2.00**	**1.80**	**1.60**	**1.50**

NOS.	5	6	7
Gauge, Nos.	15	15½	16
Approx. Tensile Strength, Lbs.	420	370	340
Weight per 100 Feet, Lbs.	4⅜	4⅕	3½
Per 100 Feet	**$1.45**	**1.40**	**1.40**

COIL CHAIN

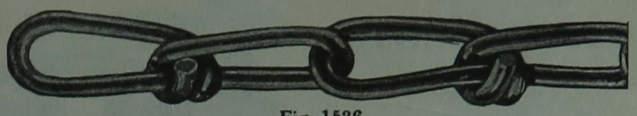


Fig. 1536

TENSO PATTERN

Galvanized, weldless wire links; durable and rust proof; most popular and neatest weldless chain on the market; its uniformity and smoothness makes it adaptable to a variety of uses, such as boat, halter, tie-out and well chains.

NOS.	7/0	6/0	5/0	4/0
Wire Gauge, Nos.	5	6	7	8
Approx. Tensile Strength, Lbs.	2500	2037	1667	1547
Weight per 100 Feet, Lbs.	38	35¼	26	24
Per 100 Feet	**$4.50**	**3.75**	**3.25**	**3.00**

NOS.	3/0	2/0	1/0	1
Wire Gauge, Nos.	9	10	11	12
Approx. Tensile Strength, Lbs.	1327	1207	924	704
Weight per 100 Feet, Lbs.	19	16	12	10
Per 100 Feet	**$2.50**	**2.00**	**1.75**	**1.60**

NOS.	2	3	4	5
Wire Gauge, Nos.	13	14	15	16
Approx. Tensile Strength, Lbs.	484	374	277	210
Weight per 100 Feet, Lbs.	7¼	5¼	4½	4
Per 100 Feet	**$1.50**	**1.40**	**1.35**	**1.25**

MACHINE CHAIN

Fig. 1537

Close twisted link; polished; used for cut-out chain on windmills; and also has a wide adaptability for other purposes where a short twisted link chain is needed.

NOS.	6/0	5/0	4/0	3/0
W & M Gauge	9/32	1/4	7/32	5
Weight per 100 Feet, Lbs.	68	61	50	40
Per 100 Feet	**$21.00**	**18.00**	**15.00**	**14.00**

NOS.	2/0	1/0	1	2	3
W & M Gauge	6	7	8	9	10
Weight per 100 Feet, Lbs.	34	28	23	20	15
Per 100 Feet	**$13.00**	**12.50**	**12.00**	**11.50**	**11.00**

PASSING LINK CHAIN

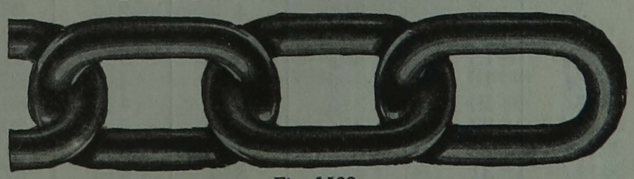


Fig. 1538

Electric welded, straight link chain, bright finish; used largely for tie-out and picket chains; links are very wide; pass freely and prevent kinking.

NO. of Wire Gauge	2/0	3/0
Wire Size, Inch	3/16	7/32
Links per Foot	14	14
Weight per 100 Feet, Lbs.	33	35
Per 100 Feet	**$9.00**	**9.75**

COIL CHAIN

STRAIGHT LINK

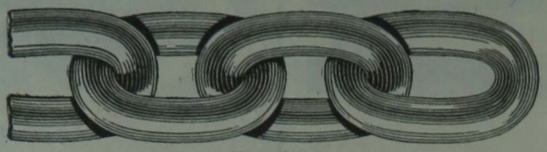


Fig. 1539

Made of high grade open hearth basic steel or iron; welded by experienced workmen; furnished natural color, as it comes from the forge, or blackened.

Size, Inches	Proof			BB			BBB		
	Approx. Links per Ft.	Wgt. per 100 Ft., Lbs.	Proof Test, Lbs.	Approx. Links per Ft.	Wgt. per 100 Ft., Lbs.	Proof Test, Lbs.	Approx. Links per Ft.	Wgt. per 100 Ft., Lbs.	Proof Test, Lbs.
3/16	13 1/2	46	1,000	14 1/2	50	1,100	15	52	1,200
1/4	12 1/2	75	1,500	13 1/2	80	1,650	14	83	1,750
5/16	11	110	2,600	12	115	3,000	12 1/2	118	3,400
3/8	10	155	3,600	11	160	4,000	11 1/2	166	4,500
7/16	9	200	4,500	9 1/2	210	5,500	10	215	6,300
1/2	8	260	6,500	8 1/2	265	7,000	9	268	8,000
9/16	7 1/2	325	8,000	8	335	8,800	8 1/4	340	10,000
5/8	6 1/2	400	9,500	7	410	10,750	7 1/4	420	12,500
3/4	6	590	13,500	6 1/4	600	15,500	6 1/2	610	17,500
7/8	5	800	18,500	5 1/4	820	21,000	5 1/2	830	24,000
1	4	1,000	24,000	4 1/4	1,030	28,500	4 1/2	1,040	31,350
1 1/8	3 3/4	1,300	29 000	4	1,350	36,000	4 1/8	1,400	38,000
1 1/4	3 3/8	1,500	39,000	3 1/2	1,550	43,000	3 5/8	1,600	47,000

BB chain is a closer link chain than the common grade. BBB chain is made from refined steel or iron and is also a closer link chain than BB.

Safe working load is about half the proof test. Average breaking strain is about double the proof test.

DREDGE CHAIN

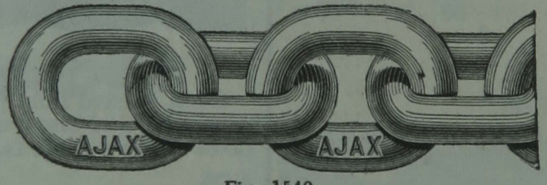


Fig. 1540

Made from a high grade iron, hand forged; will stand a tensile strain of 52,000 pounds.

Size, Inches	Average Wgt. per Foot, Lbs.	Standard Pitch,* Inches	Outside Length, Inches	Outside Width, Inches	Ajax			HB		
					Proof Test, Lbs.	Approx. Breaking Strain, Lbs.	Average Safe Working Load, Lbs.	Proof Test, Lbs.	Approx. Breaking Strain, Lbs.	Average Safe Working Load, Lbs.
5/8	4	1 11/16	3	2 1/8	14,000	27,000	8,000	12,000	25,000	7,200
3/4	6 1/4	1 15/16	3 1/2	2 1/2	20,000	40,000	12,200	18,000	36,000	10,800
7/8	8	2 3/16	4	2 7/8	26,000	52,000	16,100	24,500	48,000	14,700
1	10	2 1/2	4 5/8	3 1/4	33,750	67,500	20,500	32,000	61,000	19,200
1 1/8	13	2 3/4	5 1/8	3 3/4	41,500	83,000	25,500	40,000	78,000	24,000
1 1/4	16	3 1/8	5 3/4	4 1/8	52,000	104,000	31,200	49,000	95,000	29,400
1 3/8	19	3 9/16	6 7/16	4 9/16	60,000	120,000	36,100	58,000	114,000	34,800
1 1/2	23	3 7/8	7	5	70,400	140,800	43,400	67,000	134,000	40,200
1 5/8	28	4 1/4	7 3/4	5 1/2	81,500	163,000	50,200	77,000	154,000	46,200
1 3/4	31	4 3/4	8 1/2	5 7/8	87,500	175,000	52,500	83,000	166,000	49,800
1 7/8	35	5 1/4	9 1/4	6 3/8	100,000	200,000	60,000	95,000	190,000	57,000
2	40	5 3/4	10	6 3/4	114,000	228,000	69,600	108,000	216,000	64,800
2 1/8	47	6 1/4	10 3/4	7 1/8	129,000	258,000	77,400	122,000	244,000	73,200
2 1/4	53	6 3/4	11 1/2	7 5/8	143,000	286,000	85,800	136,500	273,000	81,900
2 3/8	58 1/2	6 7/8	11 7/8	8	159,500	319,000	95,700	152,000	304,000	91,200
2 1/2	65	7	12 1/4	8 3/8	180,000	360,000	108,000	168,500	337,000	102,100

Note.—Ajax brand differs from the H.B. brand only in the quality of the iron used.

*The pitch is the distance, center to center, of adjacent links and equals the inside length of a link.

Prices on Application

CHAIN HOOKS

GRAB

Fig. 1541

Drop forged, soft steel, self colored.

NOS.	For Chain, Inches	Weight Per 100, Lbs.	Per 100
1	1/4	27	$8.50
2	5/16	55	9.60
3	3/8	90	11.10
4	7/16	135	13.50
5	1/2	190	19.00
6	5/8	370	27.00
7	3/4	400	39.90

ROUND

Drop forged, soft steel, self colored.

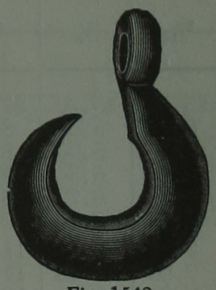


Fig. 1542

NOS.	For Chain, Inches	Weight Per 100, Lbs.	Per 100
8	1/4	27	$8.50
9	5/16	41	9.60
10	3/8	72	11.10
11	7/16	125	13.50
12	1/2	150	19.00
13	5/8	250	27.00
14	3/4	330	39.90

WELDLESS

Drop forged; with eye.

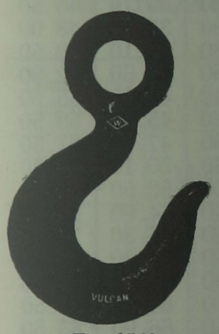


Fig. 1543

NOS.	Length Over All, Inches	For Chain, Inches	*Safe Load, Lbs.	Each
22	4 3/8	1/4, 5/16	1000	$0.36
24	5 3/8	3/8	1400	.53
25	6 1/8	7/16	2400	.73
26	6 3/4	1/2, 9/16	3400	1.05
27	7 5/8	5/8	4200	1.50
28	8 1/2	11/16	5000	2.10
29	9 1/2	3/4	6000	2.85
30	10 1/4	13/16	8000	3.70
31	11 1/2	7/8, 15/16	9400	4.70
32	12 7/8	1	11000	6.40

*Breaking strain is four times the safe working load.

CONNECTING LINKS

KEYSTONE

Composed of two similar halves centrally pivoted on same axis; forged from bar steel; taking the place of a weld, shackle snap hook or other loose metallic connection.

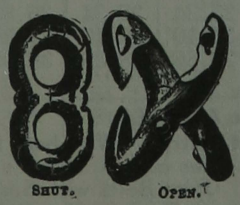


Fig. 1544

Size, Inches	Length Over All, Inches	Width Over All, Inches	Weight Per Dozen, Lbs.	Per Dozen
1/4	1 15/16	1 5/16	7/8	$2.00
5/16	2 1/4	1 1/8	1 1/2	2.25
3/8	2 9/16	1 5/16	2 3/8	2.50
7/16	2 7/8	1 1/2	3 7/8	3.25
1/2	3 1/4	1 5/8	5	4.00
5/8	4 1/4	2 1/8	10 1/2	7.50
3/4	5	2 1/2	18	10.00
7/8	5 7/8	2 15/16	30 3/4	12.50
1	6 1/2	3 1/4	43 1/2	15.00
1 1/8	7 1/2	3 5/8	60 3/8	17.50
1 1/4	8 1/2	4	84	20.00

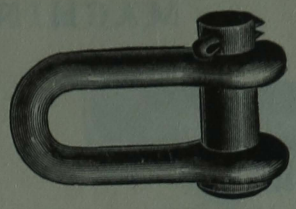


Fig. 1545

CHAIN REPAIRS

SHACKLES

Drop forged; round pin.

Size, Ins.	Lgth. Inside, Ins.	Width Inside, Ins.	Dia. Pin, Ins.	*Approx. Strength, Lbs.	Wgt. Per 100, Lbs.	Each Black	Each Galv.
1/4	13/16	1/2	5/16	5,510	12	$0.23	$0.25
5/16	1	9/16	3/8	8,320	18	.23	.25
3/8	1 7/32	5/8	7/16	10,890	29	.25	.27
7/16	1 7/16	1 1/16	1/2	15,200	46	.29	.31
1/2	1 5/8	1 3/16	9/16	18,390	68	.33	.37
9/16	1 13/16	7/8	5/8	24,800	94	.37	.41
5/8	2	1	3/4	33,400	118	.41	.48
3/4	2 7/16	1 9/32	7/8	43,400	200	.45	.55
7/8	2 7/8	1 3/8	1	55,200	296	.60	.75
1	3 1/4	1 3/4	1 1/8	74,900	425	.85	1.10
1 1/8	3 11/16	1 7/8	1 1/4	90,200	611	1.10	1.45
1 1/4	4	2	1 3/8	92,040	840	1.60	2.10
1 3/8	4 7/16	2 1/8	1 1/2	94,100	11,08	1.90	2.40
1 1/2	4 7/8	2 1/4	1 5/8	103,800	1,465	2.50	3.10

*Safe working load is one-third of strength given.

COLD SHUTS

Mild steel; self color; without shoulder.

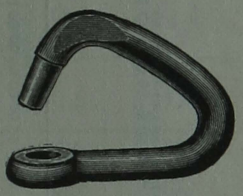


Fig. 1546

Size of Iron, Inches	Length, Inches	Weight Per 100, Lbs.	Per 100
1/4	1 1/2	9	$2.65
5/16	1 3/4	12	3.50
3/8	2	17	4.20
7/16	2 1/4	25	5.00
1/2	2 1/2	38	7.50
5/8	3	75	11.00
3/4	3 1/2	129	21.65
7/8	4	149	35.00
1	4 1/2	165	53.35

MISSING LINKS

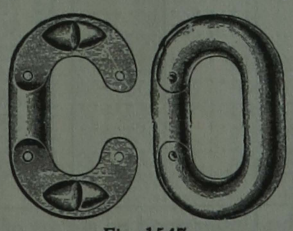


Fig. 1547

Drop forged steel, with interlocking lugs; for connecting new or repairing broken chains; used by loggers, engineers, railroad men, etc.; also a substitute for sister hooks, snap hooks, shackles, etc. Plain furnished unless otherwise ordered.

Size, Inches	Outside Dimensions of Links, Inches	Weight Per Dozen, Lbs.	Breaking Strain, Lbs.	Plain Per Dozen	Galv. Per Dozen
1/4	1 1/2x1	3/4	5,580	$1.00	$1.35
5/16	1 1/16x1 3/16	1	8,300	1.10	1.45
3/8	2 1/16x1 3/8	2	11,200	1.20	1.60
7/16	2 3/8x1 1/2	3 1/8	13,980	1.35	1.80
1/2	2 5/8x1 3/4	4 1/2	15,900	1.50	2.10
9/16	3 x1 15/16	6 5/8	19,200	1.80	2.55
5/8	3 5/16x2 3/16	9	23,900	2.00	3.00
11/16	3 1/2x2 5/16	11	27,300	2.65	3.75
3/4	3 7/8x2 1/2	14 1/4	34,100	3.35	4.50
7/8	4 1/2x2 15/16	20 1/4	38,600	5.00	6.50
1	5 x3 1/4	29	59,900	7.00	9.00
1 1/8	5 5/8x3 1/2	40	70,800	16.00	19.00
1 1/4	6 1/8x4	53 1/2	103,100	21.50	25.00
1 3/8	6 3/4x4 3/4	75	112,800	29.40	34.00
1 1/2	7 1/4x5 1/8	103	128,000	36.00	42.25

MACHINE BOLTS

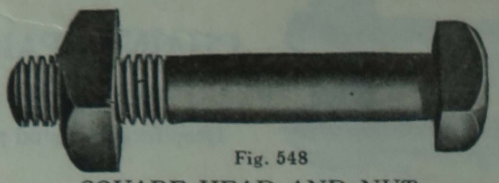


Fig. 548

SQUARE HEAD AND NUT

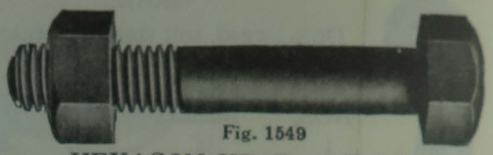


Fig. 1549

HEXAGON HEAD AND NUT

Length Measured from Under Head to Extreme Point

Manufacturers' Standard List in Effect August 1, 1912 — Price Per Hundred

With Square Heads, Square Nuts and Finished Points

Length, Inches	Diameter of Bolt, Inches											
	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
3/4 to 1 1/2	$1.70	$2.00	$2.40	$2.80	$3.60	$5.20	$5.20	$7.70	$10.50	$15.10	$22.50	$30.00
2	1.78	2.12	2.56	3.00	3.86	5.58	5.58	8.25	11.20	16.00	23.70	31.50
2 1/2	1.86	2.24	2.72	3.20	4.12	5.96	5.96	8.80	11.90	16.90	24.90	33.00
3	1.94	2.36	2.88	3.40	4.38	6.34	6.34	9.35	12.60	17.80	26.10	34.50
3 1/2	2.02	2.48	3.04	3.60	4.64	6.72	6.72	9.90	13.30	18.70	27.30	36.00
4	2.10	2.60	3.20	3.80	4.90	7.10	7.10	10.45	14.00	19.60	28.50	37.50
4 1/2	2.18	2.72	3.36	4.00	5.16	7.48	7.48	11.00	14.70	20.50	29.70	39.00
5	2.26	2.84	3.52	4.20	5.42	7.86	7.86	11.55	15.40	21.40	30.90	40.50
5 1/2	2.34	2.96	3.68	4.40	5.68	8.24	8.24	12.10	16.10	22.30	32.10	42.00
6	2.42	3.08	3.84	4.60	5.94	8.62	8.62	12.65	16.80	23.20	33.30	43.50
6 1/2	2.50	3.20	4.00	4.80	6.20	9.00	9.00	13.20	17.50	24.10	34.50	45.00
7	2.58	3.32	4.16	5.00	6.46	9.38	9.38	13.75	18.20	25.00	35.70	46.50
7 1/2	2.66	3.44	4.32	5.20	6.72	9.76	9.76	14.30	18.90	25.90	36.90	48.00
8	2.74	3.56	4.48	5.40	6.98	10.14	10.14	14.85	19.60	26.80	38.10	49.50
9	2.90	3.80	4.80	5.80	7.50	10.90	10.90	15.95	21.00	28.60	40.50	52.50
10	3.06	4.04	5.12	6.20	8.02	11.66	11.66	17.05	22.40	30.40	42.90	55.50
11	3.22	4.28	5.44	6.60	8.54	12.42	12.42	18.15	23.80	32.20	45.30	58.50
12	3.38	4.52	5.76	7.00	9.06	13.18	13.18	19.25	25.20	34.00	47.70	61.50
13	3.54	4.76	6.08	7.40	9.58	13.94	13.94	20.35	26.60	35.80	50.10	64.50
14	3.70	5.00	6.40	7.80	10.10	14.70	14.70	21.45	28.00	37.60	52.50	67.50
15	3.86	5.24	6.72	8.20	10.62	15.46	15.46	22.55	29.40	39.40	54.90	70.50
16	4.02	5.48	7.04	8.60	11.14	16.22	16.22	23.65	30.80	41.20	57.30	73.50
17	4.18	5.72	7.36	9.00	11.66	16.98	16.98	24.75	32.20	43.00	59.70	76.50
18	4.34	5.96	7.68	9.40	12.18	17.74	17.74	25.85	33.60	44.80	62.10	79.50
19	4.50	6.20	8.00	9.80	12.70	18.50	18.50	26.95	35.00	46.60	64.50	82.50
20	4.66	6.44	8.32	10.20	13.22	19.26	19.26	28.05	36.40	48.40	66.90	85.50
21	.....	.....	.....	.....	13.74	20.02	20.02	29.15	37.80	50.20	69.30	88.50
22	.....	.....	.....	.....	14.26	20.78	20.78	30.25	39.20	52.00	71.70	91.50
23	.....	.....	.....	.....	14.78	21.54	21.54	31.35	40.60	53.80	74.10	94.50
24	.....	.....	.....	.....	15.30	22.30	22.30	32.45	42.00	55.60	76.50	97.50
25	.....	.....	.....	.....	15.82	23.06	23.06	33.55	43.40	57.40	78.90	100.50
26	.....	.....	.....	.....	16.34	23.82	23.82	34.65	44.80	59.20	81.30	103.50
27	.....	.....	.....	.....	16.86	24.58	24.58	35.75	46.20	61.00	83.70	106.50
28	.....	.....	.....	.....	17.38	25.34	25.34	36.85	47.60	62.80	86.10	109.50
29	.....	.....	.....	.....	17.90	26.10	26.10	37.95	49.00	64.60	88.50	112.50
30	.....	.....	.....	.....	18.42	28.86	28.86	39.05	50.40	66.40	90.90	115.50

The Following Extras are to be Understood as a Part of the Above List:

Bolts with Hexagon Heads or Hexagon Nuts, 10 per cent. Extra. With both Hexagon Heads and Hexagon Nuts, 20 per cent. Extra. With U. S. Standard Square Nuts, Add 5 per cent. With U. S. Standard Hexagon Nuts, Add 15 per cent. Joint Bolts with Oblong Nuts, 10 per cent. Extra. Joint Bolts with Square Nuts, 5 per cent. Extra. Bolts with Tee Heads, Askew Heads and Eccentric Heads, 20 per cent. Extra. Key Bolts, 20 per cent. Extra. Bolts with Cotter Holes, 25 per cent. Extra. Special Bolts with Irregular Threads and Unusual Dimensions of Heads or Nuts will be Charged Extra, at the Discretion of the Manufacturer.

QUANTITY IN A PACKAGE

1/4-Inch, 100; 5/16, 3/8, 7/16-Inch, 50; 1/2-Inch Up to 7-Inch, 50; 1/2-Inch Over 7-Inch, 25; 5/8-Inch and 3/4-Inch Up to 12-Inch, 25. Longer Bolts, Loose.

STANDARD LENGTHS OF THREAD IN INCHES

Length, Inches	Diameter, Inches							
	1/4–5/16	3/8–7/16	1/2–9/16	5/8	3/4	7/8	1	1 1/8
1 –1 1/2	3/4	7/8	1	1 1/4	.....	.....	.....	.....
1 5/8–2	7/8	1	1	1 3/4	1 1/2	1 3/4	.....	.....
2 1/8–2 1/2	1	1	1	1 1/4	1 1/2	1 3/4	1 3/4	.....
2 5/8–3	1	1	1	1 1/4	1 1/2	1 3/4	2	2 1/4

Length, Inches	Diameter, Inches								
	1/4–5/16	3/8–7/16	1/2–9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
3 1/8– 4	1	1 1/4	1 1/4	1 1/2	1 1/2	1 3/4	2	2 1/4	2 1/2
4 1/8– 8	1	1 1/4	1 1/4	1 1/2	1 3/4	2	2 1/4	2 3/4	3
8 1/8–12	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	3	3 1/4
12 1/8–20	1	1 1/2	2	2	2	2 1/2	3	3 1/4	3 1/2

Larger bolts are threaded about three times the diameter.

ELEVATOR BOLTS

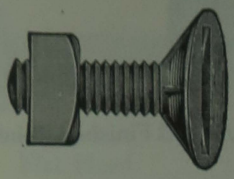


Fig. 1550

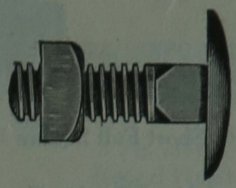


Fig. 1551

MANUFACTURERS' STANDARD LIST ADOPTED APRIL 1, 1913. PRICE PER HUNDRED

Length, Inches	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3
Diameter, 3/16 Inches	$2.20	$2.30	$2.30	$2.40	$2.50	$2.60	$2.70	$2.80	$2.90	$3.00	$3.10
Diameter, 1/4 Inches	2.20	2.30	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10
Diameter, 5/16 Inches	3.00	3.00	3.00	3.20	3.40	3.60	3.80	4.00	4.20	4.40	4 60
Diameter, 3/8 Inches	4.00	4.00	4.00	4.30	4.60	4.90	5.20	5.50	5.80	6.10	6.40

APPROXIMATE WEIGHT OF MACHINE BOLTS PER HUNDRED

Diameter, Inches	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1 1/8	1 1/4
Length, Inches	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
1 1/2	3.53	6.	8.68	13.50	19.	33.75	52.	78.	111.	174.	186.
2	4.22	7.	10.12	15.75	20.81	38.12	58.12	86.	122.	187.	203.
2 1/2	4.87	7.94	11.50	17.18	23.37	41.25	64.01	94.	133.	200.	220.
3	5.56	8.75	13.	18.93	26.12	45.93	69.68	103.12	143.	213.	277.
3 1/2	6.41	9.81	14.50	21.18	29.01	50.	74.37	111.72	154.	226.	294.
4	6.93	10.56	16.	23.01	30.75	54.68	80.	117.97	161.72	244.53	328.12
4 1/2	7.56	11.68	17.31	25.12	34.18	58.75	88.43	125.78	168.75	249.22	341.59
5	8.22	13.	19.	27.	36.87	62.81	92.81	134.37	182.	267.19	355.06
5 1/2	8.97	14.	20.	28.87	39.25	65.93	98.12	142.97	196.09	285.15	368.53
6	9.6	14.37	21.50	30.75	40.93	70.93	105.	145.31	200.	291.41	382.
6 1/2	10.2	15.7	23.25	32.25	43.43	75.31	112.93	154.68	210.93	305.86	395.47
7	10.8	16.7	24.50	34.12	47.50	79.01	118.12	164.01	225.	320.31	409.52
7 1/2	11.5	17.7	26.	37.37	52.18	83.43	124.37	170.31	234.37	335.25	422.99
8	12.1	18.7	28.	39.25	54.	86.25	130.	178.91	246.09	345.19	435.94
9	13.4	20.8	29.8	43.12	56.56	96.25	137.81	199.20	264.85	375.07	451.98
10	14.6	22.9	32.6	47.13	62.50	104.37	153.75	211.72	287.50	395.95	484.05
11	15.8	24.9	35.4	51.25	66.87	111.87	162.50	225.78	308.59	439.84	516.12
12	17.	26.9	38.2	54.68	72.50	120.62	177.50	250.	336.72	464.37	548.19
13	18.2	28.9	43.6	60.	77.62	126.56	187.81	255.47	349.22	488.90	585.39
14	19.4	31.	46.5	64.2	82.25	136.87	201.87	278.12	368.75	513.43	622.59
15	20.6	33.	49.5	68.4	89.12	145.	208.12	302.34	400.	537.96	659.79
16	21.8	35.	52.4	72.5	91.75	153.12	219.01	306.25	411.72	562.49	696.99
17	23.	37.	55.4	76.7	97.18	160.	231.75	325.	434.37	587.02	734.19
18	24.2	39.	58.4	80.8	105.	167.50	244.01	343.75	452.34	611.55	771.39
19	25.4	41.	61.3	85.	111.01	177.50	256.25	353.12	475.	655.86	808.59
20	26.6	43.	64.3	89.2	114.62	187.50	267.50	377.34	493.75	685.15	852.37
21	27.8	45.	67.20	93.3	119.2	185.5	285.4	394.3	549.5	723.2	877.2
22	29.	47.	70.15	97.5	124.4	192.9	297.5	410.3	571.2	753.	912.
23	30.	49.	73.1	101.6	130.	201.	309.5	426.3	592.7	782.7	945.3
24	31.4	51.	76.1	105.8	135.	208.4	321.5	442.3	614.4	812.5	979.
25	32.6	53.	79.	110.	140.	216.2	333.5	458.3	636.	842.2	1012.8
26	33.8	55.	82.	114.1	145.2	225.	345.5	464.	658.1	871.9	1046.
27	35.	57.	85.	118.3	150.4	232.2	357.5	480.3	679.1	901.7	1080.
28	36.2	59.	88.	122.4	156.	240.4	369.6	496.3	700.7	931.5	1114.
29	37.4	61.	90.7	126.6	161.	248.2	381.6	512.3	722.3	961.2	1147.
30	38.6	63.	94.	130.7	166.	254.9	393.6	528.3	743.9	990.9	1181.

COMMON CARRIAGE BOLTS

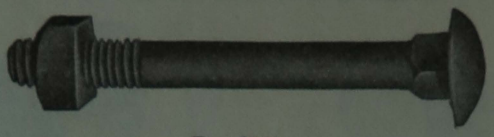


Fig. 1552

With Short Full Square Under Heads, Forged Square Nuts and Finished Points

GALVANIZED OR PLAIN

Manufacturers' Standard List Effective Nov. 1, 1912 — **Price per Hundred**

Length, Inches	Diameter, Inches								
	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
1½	$1.00	$1.00	$1.40	$1.90	$2.20	.....	.....	.....	.....
2	1.10	1.10	1.52	2.06	2.40	.....	.....	.....	.....
2½	1.20	1.20	1.64	2.22	2.60	$3.25	$5.75	$5.75	$8.50
3	1.30	1.30	1.76	2.38	2.80	3.53	6.13	6.13	9.00
3½	1.40	1.40	1.88	2.54	3.00	3.81	6.51	6.51	9.50
4	1.50	1.50	2.00	2.70	3.20	4.09	6.89	6.89	10.00
4½	1.60	1.60	2.12	2.86	3.40	4.37	7.27	7.27	10.50
5	1.70	1.70	2.24	3.02	3.60	4.65	7.65	7.65	11.00
5½	1.80	1.80	2.36	3.18	3.80	4.93	8.03	8.03	11.50
6	1.90	1.90	2.48	3.34	4.00	5.21	8.41	8.41	12.00
6½	2.00	2.00	2.60	3.50	4.20	5.49	8.79	8.79	12.50
7	2.10	2.10	2.72	3.66	4.40	5.77	9.17	9.17	13.00
7½	2.20	2.20	2.84	3.82	4.60	6.05	9.55	9.55	13.50
8	2.30	2.30	2.96	3.98	4.80	6.33	9.93	9.93	14.00
8½	2.40	2.40	3.08	4.14	5.00	6.61	10.31	10.31	14.50
9	2.50	2.50	3.20	4.30	5.20	6.89	10.69	10.69	15.00
9½	2.60	2.60	3.32	4.46	5.40	7.17	11.07	11.07	15.50
10	2.70	2.70	3.44	4.62	5.60	7.45	11.45	11.45	16.00
11	2.90	2.90	3.68	4.94	6.00	8.01	12.21	12.21	17.00
12	3.10	3.10	3.92	5.26	6.40	8.57	12.97	12.97	18.00
13	3.30	3.30	4.16	5.58	6.80	9.13	13.73	13.73	19.00
14	3.50	3.50	4.40	5.90	7.20	9.69	14.49	14.49	20.00
15	3.70	3.70	4.64	6.22	7.60	10.25	15.25	15.25	21.00
16	3.90	3.90	4.88	6.54	8.00	10.81	16.01	16.01	22.00
17	4.10	4.10	5.12	6.86	8.40	11.37	16.77	16.77	23.00
18	4.30	4.30	5.36	7.18	8.80	11.93	17.53	17.53	24.00
19	4.50	4.50	5.60	7.50	9.20	12.49	18.29	18.29	25.00
20	4.70	4.70	5.84	7.82	9.60	13.05	19.05	19.05	26.00

Add 15 per cent. extra for hexagon nuts. Intermediate lengths take next higher list. Larger diameters than ¾ inch take machine bolt list.

3/16 and ¼ inch diameter, 100 in a Package; 5/16 and 3/8 inch up to 12 inches in length and 7/16 and ½ inch up to 8 inches in length, 50 in a Package; balance 25 in a Package.

APPROXIMATE WEIGHT PER HUNDRED

Diameter, Ins. / Length, Ins.	3/16 Lbs.	1/4 Lbs.	5/16 Lbs.	3/8 Lbs.	7/16 Lbs.	1/2 Lbs.	5/8 Lbs.	3/4 Lbs.
1½	2.28	3.53	5.50	8.94	12.25	16.25	30.50	45.
2	2.53	4.21	6.75	10.12	13.81	19.13	35.25	51.
2½	2.94	4.90	7.43	11.62	15.94	21.87	38.50	57.
3	3.34	5.59	8.43	12.81	17.75	24.25	44.06	63.
3½	3.65	6.31	9.56	14.	20.	26.75	48.	69.
4	4.09	7.06	10.50	15.62	22.12	29.50	51.25	75.
4½	....	7.65	11.50	16.92	24.31	32.	55.37	81.
5	....	8.25	12.37	18.18	25.94	34.12	60.50	88.
5½	....	8.76	14.	19.62	27.81	36.50	63.75	94.
6	....	9.56	14.50	21.25	29.68	39.31	67.75	100.
6½	....	10.25	15.50	22.75	31.87	41.50	72.12	106.
7	....	11.15	17.	24.06	34.31	43.81	76.	112.
7½	....	11.75	18.	25.75	35.87	47.81	80.	118.
8	....	12.37	18.75	26.87	37.68	49.06	82.50	124.
9	....	14.	21.	30.	42.25	55.	92.50	136.
10	....	15.4	21.18	33.	46.25	58.75	102.50	148.
11	....	16.8	24.3	35.	49.44	65.93	108.75	160.
12	....	18.2	26.2	38.	53.50	71.25	119.37	172.
13	....	....	.....	41.2	59.3	74.37	125.	184.
14	....	....	.....	44.	63.2	82.09	133.63	196.
15	....	....	.....	47.	67.1	85.59	139.63	208.
16	....	....	.....	50.	71.	92.56	151.25	221.
17	....	....	.....	53.	74.9	97.50	158.56	223.
18	....	....	.....	55.5	78.8	103.09	164.37	245.
19	....	....	.....	58.	82.7	108.18	171.18	257.
20	....	....	.....	61.	86.6	111.12	179.56	269.

STOVE BOLTS

Fig. 1553
Flat Head

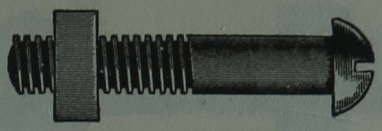


Fig. 1554
Round Head

Flat Head measured over all from top of head to point. Round Head measured from under head to extreme point.

FLAT OR ROUND HEAD

Manufacturers' Standard List Revised June 1, 1908 — **Price per Hundred with Nuts**

Length, Inches	Diameter of Bolt, Inches															
	1/8		5/32		3/16		7/32		1/4		5/16		3/8		1/2	
	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100	Wgt. Per 100, Lbs.	Per 100
3/8	.39	$.85	.53	$.85	.82	$0.85	....	....	....	....	....	....	....	....	....	....
1/2	.43	.85	.59	.85	.92	.85	1.53	$1.20	1.95	$1.20	....	....	....	....	....	....
5/8	.46	.85	.64	.85	1.01	.85	1.65	1.20	2.11	1.20	....	....	....	....	....	....
3/4	.52	.85	.71	.85	1.11	.85	1.75	1.20	2.27	1.20	3.47	$1.75	5.30	$2.65	....	....
7/8	.56	.90	.76	.90	1.19	.90	1.86	1.25	2.42	1.25	3.69	1.80	5.61	2.70	....	....
1	.60	.90	.82	.90	1.29	.90	1.96	1.30	2.57	1.30	3.95	1.85	5.99	2.75	17.15	$9.50
1 1/8	.64	.95	.88	.95	1.38	.95	2.06	1.35	2.73	1.35	4.18	1.90	6.35	2.85	....	9.50
1 1/4	.68	1.00	.94	1.00	1.48	1.00	2.17	1.40	2.89	1.40	4.43	1.95	6.73	2.90	18.53	9.50
1 3/8	.72	1.05	1.00	1.05	1.57	1.05	2.27	1.45	3.04	1.45	4.67	2.00	7.09	3.00	....	9.50
1 1/2	.76	1.10	1.06	1.10	1.67	1.10	2.37	1.50	3.20	1.50	4.91	2.05	7.47	3.10	19.88	9.50
1 3/4	.83	1.15	1.18	1.15	1.86	1.15	2.58	1.55	3.51	1.55	5.39	2.15	8.21	3.20	21.25	9.80
2	.92	1.20	1.29	1.20	2.05	1.20	2.79	1.60	3.82	1.60	5.86	2.30	8.95	3.40	22.58	10.10
2 1/4	....	....	....	....	2.24	1.25	3.01	1.70	4.13	1.70	6.37	2.40	9 70	3.60	23.95	10.35
2 1/2	....	....	....	....	2.43	1.30	3.22	1.80	4.45	1.80	6.87	2.50	10.58	3.80	25.33	10.65
2 3/4	....	....	....	....	2.62	1.40	3.43	1.90	4.76	1.90	7.38	2.60	11.45	4.00	26.71	10.90
3	....	....	....	....	2.81	1.50	3.64	2.00	5.08	2.00	7.89	2.70	12.33	4.20	28.08	11.20
3 1/4	....	....	....	....	3.00	1.60	3.85	2.10	5.40	2.10	8.39	2.85	13.19	4.40	29.38	11.50
3 1/2	....	....	....	....	3.19	1.70	4.06	2.20	5.71	2.20	8.90	3.00	14.07	4.60	30.78	11.75
3 3/4	....	....	....	....	3.39	1.80	4.27	2.30	6.03	2.30	9.41	3.15	14.95	4.80	32.13	12.00
4	....	....	....	....	3.58	1.90	4.49	2.40	6.35	2.40	9.92	3.30	15.83	5.00	33.48	12.30
4 1/4	....	....	....	....	....	2.00	....	2.50	....	2.50	....	3.45	....	5.20	....	12.60
4 1/2	....	....	....	....	....	2.10	....	2.60	....	2.60	....	3.60	....	5.40	....	12.90
4 3/4	....	....	....	....	....	2.20	....	2.70	....	2.70	....	3.75	....	5.60	....	13.15
5	....	....	....	....	....	2.30	....	2.85	....	2.85	....	3.90	....	5.80	....	13.45
5 1/4	....	....	....	....	....	2.40	....	3.00	....	3.00	....	4.10	....	6.00	....	13.75
5 1/2	....	....	....	....	....	2.50	....	3.15	....	3.15	....	4.30	....	6.20	....	14.00
5 3/4	....	....	....	....	....	2.60	....	3.30	....	3.30	....	4.50	....	6.40	....	14.30
6	....	....	....	....	....	2.75	....	3.45	....	3.45	....	4.70	....	6.60	....	14.55
6 1/4	....	....	....	....	....	2.90	....	3.60	....	3.60	....	4.90	....	6.80	....	14.35
6 1/2	....	....	....	....	....	3.05	....	3.75	....	3.75	....	5.10	....	7.00	....	15.10

For Nickel Plating, Add $1.00 Per 100 to List Price

One Hundred in a Box

COUNTERSUNK HEAD BOLTS

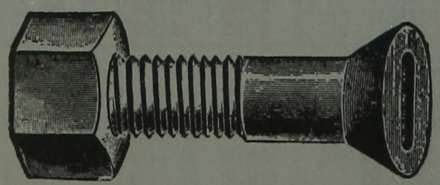


Fig. 1555

With Slot

When ordering, state length and diameter and whether with square or hexagon nuts.

Prices on Application

TRACK BOLTS

Fig. 1556
United States Standard Square Nut

Fig. 1557
United States Standard Hexagon Nut

Standard List Adopted December 26, 1917

Rails Used, Lbs.	Size Bolts, Inches	Diameter Nuts, Inches	With Square Nuts		With Hexagon Nuts	
			Number in 200 Lb. Keg	Kegs per Mile 4 Bolt Joint	Number in 200 Lb. Keg	Kegs per Mile 4 Bolt Joint
70 to 100	7/8x4 3/4	1 7/16	149	9.50	158	9.10
	7/8x4 1/2	1 7/16	155	9.20	163	8.83
	7/8x4 1/4	1 7/16	159	9.00	168	8.57
	7/8x4	1 7/16	163	8.75	173	8.32
45 to 85	3/4x4 1/4	1 1/4	224	7.	230	6.3
	3/4x4	1 1/4	231	6.3	240	6.
	3/4x3 3/4	1 1/4	239	6.	254	5.7
	3/4x3 1/2	1 1/4	240	6.	260	5.5
	3/4x3 1/4	1 1/4	250	5.7	266	5.4
	3/4x3	1 1/4	268	5.4	283	5.1
30 to 40	5/8x3 1/2	1 1/16	360	4.4	375	4.
	5/8x3	1 1/16	395	3.5	410	3.7
	5/8x2 3/4	1 1/16	420	3.4	435	3.3
	5/8x2 1/2	1 1/16	445	3.3	465	3.1
20 to 30	1/2x3	7/8	665	2.2	715	2.
	1/2x2 1/2	7/8	715	2.	760	2.
	1/2x2 1/4	7/8	750	2.	800	2.
	1/2x2	7/8	775	2.	820	2.
8 to 16	3/8x2	11/16	1560	1.	.....	.....
	3/8x1 3/4	11/16	1680	1.	.....	.....
	3/8x1 1/2	11/16	1800	1.	.....	.....
	3/8x1 1/4	11/16	1975	1.	.....	.....

EXTRAS PER 100 POUNDS OVER BASE

Diameter, Inches	3/4		5/8		9/16		1/2		7/16		3/8	
Length, Inches	Square Nut	Hex. Nut	Square Nut	Hex. Nut	Square Nut	Hex. Nut	Square Nut	Hex. Nut	Square Nut	Hex. Nut	Square Nut	Hex. Nut
3 1/2	Base	$0.30	$0.30	$0.55	.....	.....	.....	.....	.....	.....	.....	.....
3 1/4	$.20	.40	.35	.60	.....	.....	.....	.....	.....	.....	.....	.....
3	.30	.50	.40	.65	$0.85	$1.30	$0.85	$1.30	.....	.....	.....	.....
2 3/4	.40	.60	.50	.75	1.00	1.45	1.00	1.45	.....	.....	.....	.....
2 1/2	.....	.....	.60	.85	1.15	1.60	1.15	1.60	$1.55	$2.00	.....	.....
2 1/4	.....	.....	.75	1.00	1.20	1.75	1.20	1.75	1.75	2.20	$2.40	$2.95
2	.....	.....	.....	.....	1.35	1.90	1.35	1.90	1.95	2.40	2.65	3.20
1 3/4	.....	.....	.....	.....	1.55	2.10	1.55	2.10	2.15	2.60	2.90	3.45
1 1/2	.....	.....	.....	.....	1.65	2.25	1.65	2.25	2.35	2.80	3.15	3.70

Note.—Cut or rolled threads furnished.

Base—Standard Button Head, Oval Neck, 3/4-inch and larger diameter by 3 1/2 inch and longer with rolled threads and square nuts in 200 pound kegs.

Bolts with cut threads add $0.10 per 100 pounds.

Bolts with square recessed nuts add $0.10 per 100 pounds.

Bolts with Ideal recessed nuts add $0.15 per 100 pounds.

Orders for less than 200 kegs of 200 pounds each, add $1.00 per 100 pounds.

COACH AND LAG SCREWS

GIMLET POINT

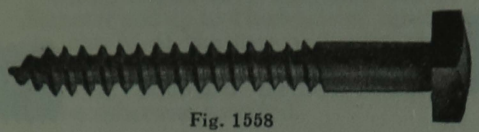


Fig. 1558

SQUARE HEADS

Length of Thread is approximately three-fifths of length of screw.

Manufacturers' Standard List in Effect November 12, 1908. Price per Hundred

Dia. In.	1/4-5/16		3/8		7/16		1/2		9/16		5/8		3/4		7/8		1	
Lgth. Inch	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100
1½	4.2	$2.25	6.5	$2.70	9.2	$3.15	13.0	$3.75	....	....	....	....	....	....	....	....	....	....
2	5.2	2.45	7.7	2.96	10.9	3.47	14.9	4.11	23.0	$6.00	24.8	$6.00	....	....	....	....	....	....
2½	6.2	2.65	9.2	3.22	12.7	3.79	17.4	4.47	26.0	6.50	29.0	6.50	43.0	$9.20	....	....	....	....
3	7.2	2.85	10.6	3.48	14.6	4.11	19.0	4.83	29.2	7.00	32.9	7.00	48.3	9.90	75.0	$15.00	....	....
3½	8.2	3.05	12.0	3.74	16.6	4.43	21.5	5.19	32.5	7.50	36.9	7.50	53.8	10.60	78.5	16.00	90.	$22.00
4	9.2	3.25	13.5	4.00	18.8	4.75	24.0	5.55	35.9	8.00	41.0	8.00	59.6	11.30	82.0	17.00	99.	23.30
4½	10.2	3.45	15.0	4.26	20.7	5.07	26.5	5.91	39.3	8.50	44.9	8.50	65.5	12.00	86.0	18.00	108.	24.60
5	11.3	3.65	16.5	4.52	22.8	5.39	29.0	6.27	42.7	9.00	48.8	9.00	71.5	12.70	90.0	19.00	118.	25.90
5½	12.4	3.85	18.0	4.78	24.9	5.71	31.5	6.63	46.1	9.50	52.7	9.50	77.5	13.40	98.0	20.00	128.	27.20
6	13.5	4.05	19.5	5.04	27.0	6.03	34.0	6.99	49.5	10.00	56.6	10.00	83.5	14.10	106.0	21.00	138.	28.50
6½	....	4.25	....	5.30	31.1	6.35	39.0	7.35	....	10.50	....	10.50	....	14.80	....	22.00	....	29.50
7	....	4.45	....	5.56	35.2	6.67	44.0	7.71	56.3	11.00	64.5	11.00	95.5	15.50	122.5	23.00	158.0	31.10
7½	....	4.65	....	5.82	....	6.99	49.0	8.07	....	11.50	....	11.50	....	16.20	....	24.00	....	32.40
8	....	4.85	....	6.08	....	7.31	54.0	8.43	63.1	12.00	72.5	12.00	107.6	16.90	129.0	25.00	178.0	33.70
9	....	5.25	....	6.60	....	7.95	....	9.15	69.9	13.00	80.5	13.00	119.8	18.30	155.5	27.00	198.0	36.30
10	....	5.65	....	7.12	....	8.59	....	9.87	76.7	14.00	88.5	14.00	131.0	19.70	172.0	29.00	219.0	38.90
11	....	6.05	....	7.64	....	9.23	....	10.59	83.5	15.00	96.5	15.60	143.1	21.10	188.5	31.00	240.0	41.50
12	....	6.45	....	8.16	....	9.87	....	11.31	90.5	16.00	104.5	16.00	155.4	22.50	205.0	33.00	261.0	44.10

For Hexagon Heads, add 10 per cent. For Tee Heads, add 20 per cent extra. Skein screws sold at the same price as lag screws.

HANGER SCREWS

Fig. 1559

One end cut with deep screw thread, finished points, other end fitted with chamfered square nuts.

Manufacturers' Standard List in Effect May 21, 1902. Price per Hundred

Dia. In.	1¼		5/16		3/8		7/16		1/2		5/8		3/4		7/8		1	
Lgth. Inch	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100	Wt. Per 100 Lbs.	Per 100
2	4.6	$3.00	5.2	$3.00	7.7	$3.60	10.9	$4.24	14.9	$5.06	24.8	$6.19	....	....	....	....	....	....
2½	5.5	3.19	6.2	3.19	9.2	3.83	12.7	4.54	17.4	5.44	29.0	6.75	43.0	$9.90	....	....	....	....
3	6.3	3.38	7.2	3.38	10.6	4.05	14.6	4.84	19.0	5.81	32.9	7.31	48.3	10.73	....	....	....	....
3½	7.2	3.57	8.2	3.57	12.0	4.28	16.6	5.14	21.5	6.19	36.9	7.88	53.8	11.55	78.0	$15.00	....	....
4	8.2	3.75	9.2	3.75	13.5	4.50	18.8	5.44	24.0	6.56	41.0	8.44	59.6	12.38	82.0	16.00	....	....
4½	9.2	3.94	10.2	3.94	15.0	4.73	20.7	5.74	26.5	6.94	44.9	9.00	65.5	13.20	86.0	17.00	....	....
5	10.1	4.13	11.3	4.13	16.5	4.95	22.8	6.04	29.0	7.31	48.8	9.56	71.5	14.03	90.0	18.00	118.0	$26.25
5½	11.0	4.32	12.4	4.32	18.0	5.18	24.9	6.34	31.5	7.69	52.7	10.13	77.5	14.85	98.0	19.00	128.0	27.50
6	12.0	4.50	13.5	4.50	19.5	5.40	27.0	6.64	34.0	8.06	56.6	10.69	83.5	15.68	106.0	20.00	138.0	28.75
6½	....	....	....	....	....	5.62	31.0	6.94	39.0	8.43	....	11.25	....	16.50	....	21.00	....	30.00
7	....	....	....	....	....	5.84	35.2	7.24	44.0	8.80	64.5	11.82	95.5	17.33	122.0	22.50	158.0	31.25
7½	....	....	....	....	....	6.06	....	7.54	49.0	9.17	....	12.38	....	18.15	....	23.44	....	32.50
8	....	....	....	....	....	6.28	....	7.84	54.0	9.55	7.25	12.95	107.6	19.03	139.0	24.37	178.0	33.75
9	....	....	....	....	....	....	....	8.14	....	9.92	80.5	13.51	119.8	19.85	155.0	26.25	198.0	35.62
10	....	....	....	....	....	....	....	....	....	10.30	88.5	14.08	131.0	20.68	172.0	27.50	219.0	37.50
11	....	....	....	....	....	....	....	....	....	....	96.5	14.64	143.1	21.50	188.0	28.75	240.0	39.38
12	....	....	....	....	....	....	....	....	....	....	104.5	15.21	155.4	22.32	205.0	30.00	261.0	41.25

¼ inch packed 100 in a Box. 5/16, 3/8, 7/16 and ½ inch packed 50 in a Box. 5/8, ¾, 7/8 and 1 inch packed 25 in a Package.
For Hexagon Nuts, add 10 per cent.

STUD BOLTS

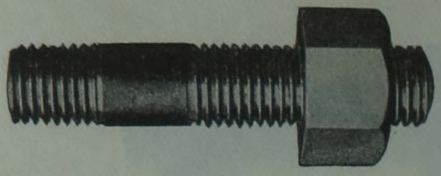


Fig. 1560

With Nut

Fig. 1561

Without Nut

Rough Iron—With one Cold Punched, Chamfered and Trimmed Hexagon Nut.

PRICE PER HUNDRED

Dia., Ins.	⅜	7/16	½	9/16	⅝	¾	⅞	1	1⅛	1¼
Threads to Inch	16	14	12 or 13	12	11	10	9	8	7	7
Length Inches 1½	$4.00	$5.10	$5.50	.....	.....	.....	.....	.....	.....	.....
1¾	4.10	5.25	5.65	.....	.....	.....	.....	.....	.....	.....
2	4.20	5.40	5 80	$8.50	$8.50	$12.40	.....	.....	.....	.....
2¼	4.30	5.55	5.95	8.75	8.75	12.70	.....	.....	.....	.....
2½	4.40	5.70	6.10	9.00	9.00	13.00	$18.00	.....	.....	.....
2¾	4.50	5.85	6.25	9.25	9.25	13.30	18.50	.....	.....	.....
3	4.60	6.00	6.40	9.50	9.50	13.60	19.00	$27.80	.....	.....
3¼	4.70	6.15	6.55	9.75	9.75	13.90	19.50	28.40	.....	.....
3½	4.80	6.30	6.70	10.00	10.00	14.20	20.00	29.00	$41.50	.....
3¾	4.90	6.45	6.85	10.25	10.25	14.50	20.50	29.60	42.25	.....
4	5.00	6.60	7.00	10.50	10.50	14.80	21.00	30.20	43.00	$60.00
4½	5.25	6.90	7.30	11.00	11.00	15.40	22.00	31.40	44.50	62.50
5	.....	.....	7.60	11.50	11.50	16.00	23.00	32.60	46.00	65.00
5½	.....	.....	8.00	12.00	12.00	16.60	24.00	33.80	47.50	67.50
6	.....	.....	8.45	12.50	12.50	17.20	25.00	35.00	49.00	70.00
7	.....	.....	.....	13.60	13.60	18.60	27.00	37.50	52.00	75.50
8	.....	.....	.....	14.80	14.80	20.10	29.10	40.10	56.00	81.00
9	.....	.....	.....	.....	.....	21.60	31.20	42.80	60.50	86.00
10	.....	.....	.....	.....	.....	23.20	33.40	45.50	65.00	92.00

Studs without Nuts furnished at a reduction of 15 per cent. from above list.
In ordering Studs, state whole length, and length of thread required on each end.
When Studs are ordered with semi-finished or finished case-hardened Nuts, special prices will be made.

TAP BOLTS

Fig. 1562

Forged—With Square Head

Manufacturers' Standard List Adopted January 30, 1895 PRICE PER HUNDRED

Length Under Head, Inches	Diameter, Inches									
	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
1½	$1.00	$1.15	$1.35	$1.60	$2.00	$3.00	$3.00	$4.20	$6.00	$8.00
1¾	1.05	1.21	1.42	1.69	2.10	3.12	3.12	4.35	6.20	8.25
2	1.10	1.27	1.49	1.78	2.20	3.24	3.24	4.50	6.40	8.50
2¼	1.15	1.33	1.56	1.87	2.30	3.36	3.36	4.65	6.60	8.75
2½	1.20	1.39	1.63	1.96	2.40	3.48	3.48	4.80	6.80	9.00
2¾	1.25	1.45	1.70	2.05	2.50	3.60	3.60	4.95	7.00	9.25
3	1.30	1.51	1.77	2.14	2.60	3.72	3.72	5.10	7.20	9.50
3¼	.....	1.57	1.84	2.23	2.70	3.84	3.84	5.25	7.40	9.75
3½	.....	.....	1.91	2.32	2.80	3.96	3.96	5.40	7.60	10.00
3¾	.....	.....	.....	2.41	2.90	4.08	4.08	5.55	7.80	10.25
4	.....	.....	.....	.....	3.00	4.20	4.20	5.70	8.00	10.50
Add for each ½ in.	$0.20	.25	.30	.40	.50	.60	.60	.75	.95	1.20

Tap bolts with hexagon heads, add 10 per cent.
Tap bolts faced or milled under head, special prices will be made on application.

CAP SCREWS

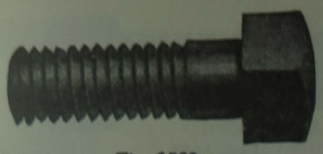


Fig. 1563
Square Head

On all screws of 1 inch and less in diameter and up to 4 inches long, threads are cut ¾ of the length; longer than 4 inches, threads are cut ½ the length. U. S. Standard threads furnished unless otherwise specified.

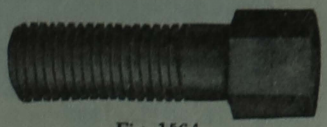


Fig. 1564
Hexagon Head

Manufacturers' Standard List adopted April 1, 1905. Per Hundred

Diameter of Square Head, Inches		3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1 1/8	1 1/4	1 3/8	1 1/2
Diameter of Hexagon Head, Inches		7/16	1/2	9/16	5/8	3/4	13/16	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2
Diameter of Screw, Inches		1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Length Under Head to Extreme Point, Inches	3/4	$3.00	$3.25	$3.75	$4.50	$5.70	.....	.....	.....	.....	.....	.....	.....
	7/8	3.15	3.40	3.90	4.70	5.80	.....	.....	.....	.....	.....	.....	.....
	1	3.25	3.50	4.00	4.90	5.90	$9.25	$9.25	.....	.....	.....	.....	.....
	1 1/4	3.50	3.75	4.25	5.30	6.50	9.50	9.50	$12.50	.....	.....	.....	.....
	1 1/2	3.75	4.00	4.50	5.70	7.10	10.00	10.00	13.50	$18.40	.....	.....	.....
	1 3/4	4.00	4.25	4.85	6.10	7.70	10.75	10.75	14.50	19.70	$22.75	.....	.....
	2	4.25	4.85	5.20	6.50	8.30	11.50	11.50	15.50	21.00	25.00	$34.00	$38.50
	2 1/4	4.70	5.35	5.55	7.15	8.90	12.60	12.60	16.50	22.40	27.25	36.75	42.00
	2 1/2	5.25	5.80	6.00	7.50	9.50	13.60	13.60	17.50	23.70	29.50	39.50	45.50
	2 3/4	5.75	6.30	6.65	7.90	10.10	14.40	14.40	19.00	25.00	31.75	42.25	49.00
	3	6.25	6.80	7.20	8.40	10.70	15.20	15.20	20.60	26.40	34.00	45.00	52.50
	3 1/4	.....	.....	.....	9.15	11.50	16.00	16.00	22.10	28.20	36.25	47.75	56.00
	3 1/2	.....	.....	.....	9.75	12.30	17.30	17.30	23.70	30.00	38.50	50.50	59.50
	3 3/4	.....	.....	.....	10.50	13.10	18.60	18.60	25.30	31.80	40.75	53.25	63.00
	4	.....	.....	.....	11.10	13.90	19.90	19.90	26.90	33.60	43.00	56.00	66.50
	4 1/4	.....	.....	.....	.....	.....	.....	21.20	28.50	35.40	45.25	58.75	70.00
	4 1/2	.....	.....	.....	.....	.....	.....	22.50	30.10	37.20	47.50	61.50	73.50
	4 3/4	.....	.....	.....	.....	.....	.....	.....	31.70	39.00	49.75	64.25	77.00
	5	.....	.....	.....	.....	.....	.....	.....	.....	40.80	52.00	67.00	80.50
Threads Per Inch		20	18	16	14	12 or 13	12	11	10	9	8	7	7
Add for each 1/4 Inch		$0.40	.50	.60	.70	.80	1.30	1.30	1.60	1.80	2.25	2.75	3.50

In ordering screws ½ inch in diameter, advise whether wanted with 12 or 13 threads.

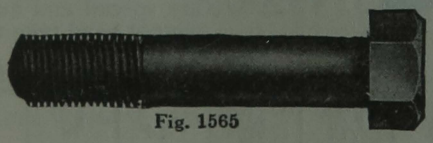


Fig. 1565

S. A. E. STANDARD HEXAGON HEAD

List Price Per Hundred

Diameter Head, Inches		7/16	1/2	9/16	5/8	3/4	7/8	15/16	1	1 1/16	1 1/4
Length Head, Inches		3/16	15/64	9/32	21/64	3/8	27/64	15/32	33/64	9/16	21/32
Length Thread, Inches		5/8	23/32	13/16	29/32	1	1 3/32	1 3/16	1 9/32	1 3/8	1 9/16
Threads to Inch		28	24	24	20	20	18	18	16	16	14
Diameter Screw, Inches		1/4	5/16	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8
Length, Inches	3/4	$3.45	$4.10	$4.70	$6.50	$7.00	.....	.....	.....	.....	.....
	7/8	3.65	4.30	4.90	6.60	7.20	.....	.....	.....	.....	.....
	1	3.85	4.50	5.10	6.80	7.40	.....	.....	.....	.....	.....
	1 1/4	4.10	4.80	5.35	7.35	8.15	$11.90	.....	.....	.....	.....
	1 1/2	4.40	5.10	5.65	8.00	8.90	12.50	$14.70	$16.90	.....	.....
	1 3/4	4.70	5.45	6.05	8.65	9.65	13.45	15.80	18.15	$24.65	$28.45
	2	5.00	6.05	6.50	9.25	10.40	14.40	16.90	19.40	26.25	31.25
	2 1/4	5.90	6.70	6.95	10.05	11.15	15.75	18.20	20.65	28.00	34.10
	2 1/2	6.55	7.25	7.50	10.65	11.90	17.00	19.45	21.90	29.65	36.90
	2 3/4	7.20	7.90	8.30	11.25	12.60	18.00	20.90	23.80	31.25	39.70
	3	7.80	8.50	9.00	11.95	13.40	19.00	22.40	25.75	33.00	42.50
	3 1/4	.....	.....	.....	12.90	14.40	20.00	23.90	27.65	35.25	45.35
	3 1/2	.....	.....	.....	13.80	15.40	21.65	25.65	29.65	37.50	48.15
	3 3/4	.....	.....	.....	14.75	16.40	23.25	27.45	31.65	39.75	50.95
	4	.....	.....	.....	15.65	17.40	24.90	29.25	33.65	42.00	53.75
	4 1/4	.....	.....	.....	.....	18.40	26.50	31.10	35.65	44.25	56.55
	4 1/2	.....	.....	.....	.....	19.40	28.15	33.90	37.65	46.50	59.40
	4 3/4	.....	.....	.....	.....	.....	.....	36.70	39.65	48.75	62.20
	5	.....	.....	.....	.....	.....	.....	39.50	41.65	51.00	65.00

Fig. 1566
Fillister Head

CAP SCREWS

Fig. 1567
Round Head

Milled from bars slightly larger than the heads. Heads are true with the body and well finished. Length of head is the same as diameter of screws.

LIST PRICE PER HUNDRED

Diameter Head, Inches	3/16	1/4	3/8	7/16	9/16	5/8	3/4	13/16	7/8	1
Threads Per Inch	40	24	20	18	16	14	12 or 13	12	11	10
Diameter Screw, Inches	1/8	3/16	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4
Length Inches 3/4	$2.00	$2.25	$2.50	$3.00	$3.50	$4.00	$5.00	.....	.....	.....
1	2.25	2.50	2.75	3.25	3.75	4.25	5.30	$6.60	.....	.....
1 1/4	2.50	2.75	3.00	3.50	4.00	4.50	5.60	6.90	$9.00	.....
1 1/2	2.75	3.00	3.25	3.75	4.25	4.75	5.90	7.20	9.50	$12.00
1 3/4	3.00	3.25	3.50	4.00	4.50	5.00	6.20	7.50	10.00	12.50
2	3.25	3.50	3.75	4.35	5.00	5.50	6.75	8.00	10.75	13.00
2 1/4	3.50	3.75	4.00	4.75	5.50	6.00	7.25	8.50	11.50	13.75
2 1/2	3.75	4.00	4.25	5.15	6.00	6.50	7.75	9.00	12.00	14.50
2 3/4	4.00	4.25	4.50	5.55	6.50	7.00	8.25	9.50	12.75	15.25
3	4.25	4.50	4.75	5.95	7.00	7.50	8.75	10.00	13.50	16.00
3 1/4	.....	4.75	5.00	6.35	7.50	8.00	9.25	10.50	14.25	16.75
3 1/2	.....	.....	5.25	6.75	8.00	8.50	9.75	11.00	15.00	17.50
3 3/4	.....	.....	.....	7.15	8.50	9.00	10.25	11.50	15.75	18.25
4	.....	.....	.....	.....	9.00	9.50	10.75	12.00	16.50	19.00
4 1/4	.....	.....	.....	.....	.....	10.00	11.25	12.50	17.25	19.75
4 1/2	.....	.....	.....	.....	.....	.....	11.75	13.00	18.00	20.50
4 3/4	.....	.....	.....	.....	.....	.....	12.25	13.50	18.75	21.25
5	.....	.....	.....	.....	.....	.....	12.75	14.00	19.50	22.00
5 1/4	.....	.....	.....	.....	.....	.....	13.25	14.50	20.25	22.75
5 1/2	.....	.....	.....	.....	.....	.....	13.75	15.00	21.00	23.50
5 3/4	.....	.....	.....	.....	.....	.....	14.25	15.50	21.75	24.25
6	.....	.....	.....	.....	.....	.....	14.75	16.00	22.50	25.00

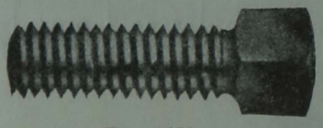


Fig. 1568

IRON SET SCREWS

Case hardened square head with cup and oval points are standard. Points of other shapes are special and made to order. Low head and slotted head take the same list as regular.

U. S. STANDARD THREADS — LIST PRICE PER HUNDRED

Diameter of Screw, Inches	1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8	1 1/4
Length under head to extreme point, inches 1/2	$1.80	$2.00	$2.35	.....	.....	.....	.....	.....	.....	.....	.....	.....
5/8	1.90	2.10	2.45	$2.80	$3.30	.....	.....	.....	.....	.....	.....	.....
3/4	2.00	2.20	2.50	2.90	3.40	$5.00	$5.00	.....	.....	.....	.....	.....
7/8	2.10	2.30	2.60	3.00	3.60	5.50	5.50	.....	.....	.....	.....	.....
1	2.15	2.35	2.65	3.10	3.80	5.75	5.75	$10.00	.....	.....	.....	.....
1 1/4	2.30	2.50	2.85	3.50	4.30	6.50	6.50	11.00	$15.50	.....	.....	.....
1 1/2	2.50	2.70	3.10	4.00	4.80	7.25	7.25	12.00	16.20	$22.00	.....	.....
1 3/4	2.75	3.00	3.50	4.50	5.40	8.00	8.00	12.80	17.70	24.00	$41.70	.....
2	3.25	3.50	4.00	5.15	6.00	8.80	8.80	13.60	19.20	26.00	45.00	$54.00
2 1/4	3.75	4.00	4.50	5.75	6.75	9.60	9.60	14.50	20.70	28.00	48.30	58.30
2 1/2	4.25	4.50	5.00	6.35	7.50	10.40	10.40	15.40	22.20	30.00	51.60	62.60
2 3/4	4.75	5.00	5.50	6.75	8.25	11.20	11.20	16.30	23.70	32.00	54.90	66.90
3	5.25	5.50	6.00	7.20	9.00	12.00	12.00	17.30	25.20	34.00	58.20	71.20
3 1/4	.....	.....	.....	7.60	9.75	12.75	12.75	18.40	26.70	36.00	61.50	75.50
3 1/2	.....	.....	.....	8.00	10.50	13.50	13.50	19.50	28.20	38.00	64.80	79.80
3 3/4	.....	.....	.....	8.50	11.25	14.30	14.30	20.75	29.70	40.00	68.10	84.10
4	.....	.....	.....	9.00	12.00	15.10	15.10	22.00	31.20	42.00	71.40	88.40
4 1/4	.....	.....	.....	.....	.....	.....	15.90	23.50	32.70	44.00	74.70	92.70
4 1/2	.....	.....	.....	.....	.....	.....	16.70	25.00	34.20	46.00	78.00	97.00
4 3/4	.....	.....	.....	.....	.....	.....	.....	26.50	35.70	48.00	81.30	101.30
5	.....	.....	.....	.....	.....	.....	.....	.....	37.20	50.00	84.60	105.60
Threads Per Inch	20	18	16	14	12 or 13	12	11	10	9	8	7	7
Add for each 1/4 Inch	$0.50	.60	.70	.80	.90	1.10	1.10	1.50	1.70	2.25	3.30	4.30

For price of steel set screws, add 25 per cent to the above list.

Fig. 1569

SAFETY SET SCREWS

ALLEN

Clean socket holes; uniform threads; absolute safety; 30 per cent stronger. Indorsed by the Underwriters' Laboratories of Chicago, and all Liability Insurance concerns in America.

PRICES PER 100 INCLUDING WRENCHES

Length, Inches	Diameter, Inches															
	¼	5/16	⅜	7/16	½	9/16	⅝	11/16	¾	13/16	⅞	15/16	1	1⅛	1¼	1⅜	1½
¼	$5.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5/16	5.00	$5.00	$6.25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
⅜	5.00	5.00	5.00	$7.50	$8.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7/16	5.00	5.00	5.00	6.00	8.75	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
½	5.50	5.60	5.00	6.00	7.00	$10.00	$12.50	$15.00	$15.00	.....	.....	.....	.....	.....	.....	.....	.....
9/16	5.50	5.60	6.95	7.00	7.00	8.00	12.50	15.00	15.00	.....	.....	.....	.....	.....	.....	.....	.....
⅝	5.50	5.60	6.95	7.00	7.00	10.00	15.00	15.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
¾	6.00	6.20	7.65	8.30	9.65	11.10	10.00	12.00	12.00	$20.00	$20.00	$25.00	$25.00	.....	.....	.....	.....
⅞	6.00	6.20	7.65	8.30	9.65	11.10	12.00	13.00	13.00	15.00	15.00	25.00	25.00	.....	.....	.....	.....
1	6.50	6.80	8.35	9.10	10.55	12.20	14.70	12.00	12.00	15.00	15.00	20.00	20.00	.....	.....	.....	.....
1⅛	6.50	7.40	8.35	9.10	10.55	12.20	14.70	16.50	16.50	18.00	18.00	25.00	25.00	$35.00	.....	.....	.....
1¼	7.00	8.00	9.05	9.90	11.45	13.30	15.80	18.00	18.00	20.00	20.00	22.00	22.00	36.65	$40.00	.....	.....
1⅜	7.50	8.00	9.75	10.70	12.35	14.40	16.90	19.50	19.50	23.55	23.55	31.75	31.75	38.30	44.00	$45.00	.....
1½	7.50	8.00	9.75	10.70	12.35	14.40	16.90	19.50	19.50	25.55	25.55	31.75	31.75	39.95	48.00	50.00	$50.00
1⅝	8.00	8.60	10.45	11.50	13.25	15.50	18.00	21.00	21.00	27.25	27.25	34.00	34.00	41.60	52.00	55.00	56.00
1¾	8.00	8.60	10.45	11.50	13.25	15.50	18.00	21.00	21.00	27.25	27.25	35.00	35.00	42.25	56.00	60.00	62.00
2	8.50	9.20	11.15	12.30	14.15	16.60	19.10	22.50	22.50	28.95	28.95	36.25	36.25	45.55	60.00	65.00	68.00
2¼	9.00	9.80	11.85	13.10	15.05	17.70	20.20	24.00	24.00	30.60	30.60	38.50	38.50	48.85	64.00	70.00	74.00
2½	9.50	10.40	12.55	13.90	15.95	18.80	21.30	25.50	25.50	32.35	32.35	40.75	40.75	52.15	68.00	75.00	80.00
2¾	10.00	11.00	13.25	14.70	16.85	19.90	22.40	27.00	27.00	34.05	34.05	43.00	43.00	55.45	72.00	80.00	86.00
3	10.50	11.60	13.95	15.50	17.75	21.00	23.50	28.50	28.50	35.75	35.75	45.25	45.25	58.75	76.00	85.00	92.00
3¼	11.00	12.20	14.65	16.30	18.65	22.10	24.60	30.00	30.00	37.45	37.45	47.50	47.50	62.05	80.00	90.00	98.00
3½	11.50	12.80	15.35	17.10	19.55	23.20	25.70	31.50	31.50	39.15	39.15	49.75	49.75	65.35	84.00	95.00	104.00
3¾	12.00	13.40	16.05	17.90	20.45	24.30	26.80	33.00	33.00	40.85	40.85	52.00	52.00	68.65	88.00	100.00	110.00
4	12.50	14.00	16.75	18.70	21.35	25.40	27.90	34.50	34.50	42.55	42.55	54.25	54.25	71.95	92.00	105.00	116.00
U.S.S.or V Threads per Inch	20	18	16	14	12–13	12	11	11	10	10	9	9	8	7	7	6	6
S.A.E.Threads per In.	28	24	24	20	20	18	18	16	16		14		14	12	12	12	12
Whitworth Threads per Inch	20	18	16	14	12	12	11	11	10	10	9	9	8	7	7	6	6
Size of Hex. Hole, Inches	⅛	5/32	3/16	7/32	¼	¼	5/16	C ⅜	⅜	½	½	9/16	9/16	9/16	⅝	¾	13/16
Wrenches Free Per 100 Screws	8	8	8	8	8	8	8	8	8	8	8	4	4	4	4	4	4
Extra Wrenches, each	$.03	.04	.05	.06	.07	.07	.08	.10	.10	.12	.12	.15	.15	.15	.20	.30	.35

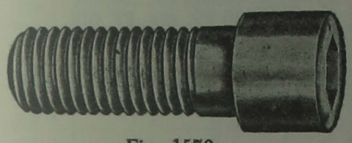


Fig. 1570

SAFETY CAP SCREWS

ALLEN

Convenient for close corners where no wrench can be used on a cap screw. They are threaded accurately to standard gauges, and are perfect in lead.

Length, Inches	Diameter, Inches									
	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
¾	$6.00	$7.00	$8.00	$9.00	$10.00	.....	.....	.....	.....	.....
1	6.50	7.50	8.50	9.50	10.50	$11.00	$20.00	.....	.....	.....
1¼	7.00	8.00	9.00	10.00	11.00	11.50	20.50	.....	.....	.....
1½	7.50	8.50	9.50	10.50	11.50	12.00	21.00	$23.00	.....	.....
1¾	8.00	9.00	10.00	11.00	12.00	12.50	21.50	23.75	$38.00	.....
2	8.50	9.50	10.50	11.50	12.50	13.00	22.00	24.50	39.00	$45.00
2¼	9.00	10.00	11.00	12.00	13.00	13.50	22.50	25.25	40.00	47.00
2½	9.50	10.50	11.50	12.50	13.50	14.00	23.00	26.00	41.00	49.00
2¾	10.00	11.00	12.00	13.00	14.00	14.50	23.50	26.75	42.00	51.00
3	10.50	11.50	12.50	13.50	14.50	15.00	24.00	27.50	43.00	53.00
3¼	11.00	12.00	13.00	14.00	15.00	15.50	24.50	28.25	44.00	55.00
3½	11.50	12.50	13.50	14.50	15.50	16.00	25.00	29.00	45.00	57.00
3¾	.....	.....	14.00	15.00	16.00	16.50	25.50	29.75	46.00	59.00
4	.....	.....	14.50	15.50	16.50	17.00	26.00	32.00	47.00	61.00
4¼	.....	.....	.....	16.00	17.00	17.50	26.50	33.25	48.00	63.00
4½	.....	.....	.....	16.50	17.50	18.00	27.00	34.50	49.00	65.00
4¾	.....	.....	.....	.....	18.00	18.50	27.50	35.75	50.00	67.00
5	.....	.....	.....	.....	18.50	19.00	28.00	37.00	51.00	69.00
5¼	.....	.....	.....	.....	19.00	19.50	28.50	38.25	52.00	71.00
5½	.....	.....	.....	.....	19.50	20.00	29.00	39.50	53.00	73.00
5¾	.....	.....	.....	.....	20.00	20.50	29.50	40.75	54.00	75.00
6	.....	.....	.....	.....	20.50	21.00	30.00	42.00	55.00	77.00
U. S. S. or V Threads per Inch	20	18	16	14	†12–13	12	11	10	9	8
S. A. E. Threads per Inch	28	24	24	20	20	18	18	16	14	14
Whitworth Threads per Inch	20	18	16	14	12	12	11	10	9	8
Diameter of Head	⅜	7/16	9/16	⅝	¾	13/16	⅞	1	1⅛	1¼
Oval Head Length of Side	15/64	9/32	21/64	13/32	15/32	33/64	37/64	45/64	53/64	61/64
Length of Flat Head	¼	5/16	⅜	7/16	½	9/16	⅝	¾	⅞	1
Size of Hex. Hole	3/16	7/32	5/16	5/16	⅜	⅜	½	9/16	9/16	⅝
Wrenches Free per 100 Screws	4	4	4	4	4	4	4	4	4	4
Extra Wrenches, Each	$.05	.06	.08	.08	.10	.10	.12	.15	.15	.20

MACHINE SCREWS

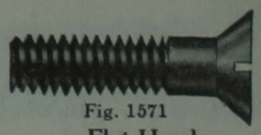


Fig. 1571
Flat Head

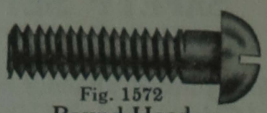


Fig. 1572
Round Head

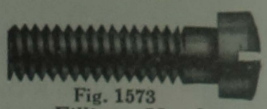


Fig. 1573
Fillister Head

List of November 18, 1912

PRICE PER GROSS

Standard Threads per Inch	48, 56 64	48 56	32, 36 40		30, 32 36	30 32	30, 32 36	24, 30 32		20 24	18, 20 24	16, 18 20		16 18	14, 16 18	14 16	13
NOS.	2	3	4	5	6	7	8	9	10	12	14	16	18	20	24	30	34
Diameter, Inches	5/64	3/32	7/64	1/8	9/64	....	5/32	11/64	3/16	7/32	15/64	1/4	9/32	5/16	3/8	15/32	1/2
Stubs, Wire Gauge Nos.	14	13	12	11	10	9	8	7	....	5	4	3	2	1	00	.....	.....
Length, Inches	IRON																
1/8	$.30	$.30	$.30	$.35	$.35	$.40	$.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3/16	.30	.30	.30	.35	.35	.40	.40	$.60	$.60	.....	.....	.....	.....	.....	.....	.....	.....
1/4	.30	.30	.30	.35	.35	.40	.40	.60	.60	$.70	$.85	.....	.....	.....	.....	.....	.....
5/16	.32	.32	.32	.37	.37	.44	.44	.65	.65	.75	.90	$1.15	.....	.....	.....	.....	.....
3/8	.32	.32	.32	.37	.37	.44	.44	.65	.65	.75	.90	1.15	$1.50	$1.90	$2.30	.....	.....
7/16	.34	.34	.34	.39	.39	.48	.48	.70	.70	.80	.95	1.20	1.60	2.00	2.40	.....	.....
1/2	.34	.34	.34	.39	.39	.48	.48	.70	.70	.80	.95	1.20	1.60	2.00	2.40	.....	.....
9/16	.37	.37	.37	.42	.42	.52	.52	.75	.75	.85	1.00	1.25	1.70	2.10	2.50	.....	.....
5/8	.37	.37	.37	.42	.42	.52	.52	.75	.75	.85	1.00	1.25	1.70	2.10	2.50	.....	.....
11/16	.41	.41	.41	.46	.46	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3/4	.41	.41	.41	.46	.46	.56	.56	.80	.80	.90	1.05	1.30	1.80	2.20	2.60	$4.00	$5.10
13/16	.45	.45	.45	.50	.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7/8	.45	.45	.45	.50	.50	.60	.60	.85	.85	.95	1.15	1.40	1.90	2.30	2.70	4.25	5.85
15/16	.....	.....	.50	.55	.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.50	.55	.55	.65	.65	.90	.90	1.00	1.25	1.50	2.00	2.40	2.80	4.50	6.60
1 1/8	.....	.....	.55	.60	.60	.70	.70	1.00	1.00	1.10	1.35	1.60	2.20	2.60	3.00	5.00	7.00
1 1/4	.....	.....	.60	.65	.65	.75	.75	1.10	1.10	1.20	1.45	1.75	2.40	2.80	3.20	5.25	7.35
1 3/8	.....	.....	.65	.70	.70	.80	.80	1.20	1.20	1.30	1.55	1.90	2.60	3.00	3.40	5.75	8.00
1 1/2	.....	.....	.70	.75	.75	.85	.85	1.30	1.30	1.40	1.65	2.10	2.80	3.20	3.60	6.00	8.00
1 5/8	.....	.....	.80	.85	.85	.95	.95	1.40	1.40	1.50	1.75	2.30	3.00	3.40	3.80	6.35	.....
1 3/4	.....	.....	.90	.95	.95	1.05	1.05	1.50	1.50	1.60	1.85	2.50	3.20	3.60	4.20	6.65	8.60
1 7/8	.....	.....	1.00	1.05	1.05	1.15	1.15	1.60	1.60	1.70	2.00	2.70	3.40	3.80	4.40	7.00	.....
2	.....	.....	1.10	1.15	1.15	1.25	1.25	1.70	1.70	1.80	2.20	2.90	3.60	4.00	4.60	7.35	9.40
2 1/4	.....	.....	.....	1.25	1.25	1.45	1.45	1.90	1.90	2.20	2.60	3.30	4.00	4.40	4.80	8.00	10.30
2 1/2	.....	.....	.....	.....	.....	1.65	1.65	2.20	2.20	2.50	2.80	3.50	4.40	4.90	5.30	8.90	11.50
2 3/4	.....	.....	.....	.....	.....	1.90	1.90	2.50	2.50	2.90	3.20	4.00	4.90	5.40	5.90	9.85	.....
3	.....	.....	.....	.....	.....	2.30	2.30	2.90	2.90	3.50	3.80	4.50	5.60	6.00	7.40	11.00	.....
3 1/4	.....	.....	.....	.....	.....	.....	.....	3.30	3.30	4.25	4.50	5.50	6.50	7.00	8.80	13.00	.....
3 1/2	.....	.....	.....	.....	.....	.....	.....	3.75	3.75	5.00	5.25	6.50	7.50	8.50	10.10	15.00	.....
3 3/4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.00	7.50	8.50	9.25	12.20	17.50	.....
4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.75	8.50	9.60	10.25	13.50	20.50	.....
	BRASS																
1/8	$.32	$.32	$.36	$.46	$.46	$.70	$.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3/16	.32	.32	.36	.46	.46	.70	.70	$1.00	$1.00	.....	.....	.....	.....	.....	.....	.....	.....
1/4	.32	.32	.36	.46	.46	.70	.70	1.00	1.00	$1.25	$1.65	.....	.....	.....	.....	.....	.....
5/16	.34	.34	.38	.49	.49	.75	.75	1.05	1.05	1.35	1.75	.....	.....	.....	.....	.....	.....
3/8	.36	.36	.40	.52	.52	.80	.80	1.10	1.10	1.45	1.85	$2.90	$3.70	$4.60	$5.50	.....	.....
7/16	.38	.38	.42	.55	.55	.85	.85	1.15	1.15	1.55	2.00	3.05	3.90	4.80	5.60	.....	.....
1/2	.40	.40	.44	.58	.58	.90	.90	1.25	1.25	1.65	2.15	3.20	4.10	5.00	5.75	.....	.....
9/16	.43	.43	.47	.62	.62	.95	.95	1.35	1.35	1.75	2.30	3.35	4.30	5.25	6.30	.....	.....
5/8	.46	.46	.50	.66	.66	1.00	1.00	1.45	1.45	1.85	2.45	3.50	4.50	5.50	6.50	.....	.....
11/16	.49	.49	.53	.70	.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3/4	.52	.52	.56	.74	.74	1.10	1.10	1.65	1.65	2.05	2.75	3.80	4.90	6.00	6.70	.....	$15.75
13/16	.55	.55	.59	.78	.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7/8	.58	.58	.62	.82	.82	1.20	1.20	1.85	1.85	2.25	3.05	4.10	5.30	6.50	7.40	.....	17.10
15/16	.....	.....	.65	.86	.86	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.70	.90	.90	1.30	1.30	2.05	2.05	2.45	3.35	4.40	5.70	7.00	8.50	$15.75	18.50
1 1/8	.....	.....	.80	1.05	1.05	1.45	1.45	2.20	2.20	2.65	3.55	4.65	6.00	7.50	9.00	.....	.....
1 1/4	.....	.....	.90	1.20	1.20	1.60	1.60	2.35	2.35	2.85	3.75	4.90	6.30	8.00	9.90	18.75	22.10
1 3/8	.....	.....	1.00	1.35	1.35	1.75	1.75	2.50	2.50	3.05	3.95	5.20	6.60	8.50	11.50	.....	.....
1 1/2	.....	.....	1.10	1.50	1.50	1.90	1.90	2.65	2.65	3.25	4.15	5.50	6.90	9.00	12.00	22.50	26.65
1 5/8	.....	.....	1.25	1.70	1.70	2.10	2.10	2.85	2.85	3.50	4.40	5.85	7.30	9.50	.....	.....	.....
1 3/4	.....	.....	1.40	1.90	1.90	2.30	2.30	3.05	3.05	3.75	4.65	6.20	7.70	10.00	12.70	24.25	28.10
1 7/8	.....	.....	1.55	2.10	2.10	2.50	2.50	3.25	3.25	4.00	4.90	6.60	8.10	10.50	.....	.....	.....
2	.....	.....	1.70	2.30	2.30	2.70	2.70	3.45	3.45	4.25	5.15	7.00	8.60	11.00	13.50	26.00	30.20
2 1/4	.....	.....	.....	2.70	2.70	3.10	3.10	3.85	3.85	4.75	5.65	8.00	9.75	12.00	14.90	28.00	32.95
2 1/2	.....	.....	.....	.....	.....	.....	.....	4.65	4.65	5.80	6.80	9.00	10.50	13.50	15.50	30.50	35.65
2 3/4	.....	.....	.....	.....	.....	.....	.....	6.00	6.00	7.00	8.00	10.00	12.50	15.00	17.00	33.00	.....
3	.....	.....	.....	.....	.....	.....	.....	7.50	7.50	8.50	9.50	11.00	15.00	16.50	19.00	36.00	.....
3 1/4	.....	.....	.....	.....	.....	.....	.....	9.00	9.00	10.50	11.50	15.00	17.50	18.50	22.50	39.50	.....
3 1/2	.....	.....	.....	.....	.....	.....	.....	11.00	11.00	12.50	15.00	18.00	19.50	22.00	25.50	42.75	.....
3 3/4	.....	.....	.....	.....	.....	.....	.....	13.50	13.50	15.00	18.50	20.00	22.50	25.00	28.00	46.60	.....
4	.....	.....	.....	.....	.....	.....	.....	16.50	16.50	18.00	22.00	25.00	26.50	26.50	32.00	49.50	.....

IRON WOOD SCREWS

Manufacturers' Standard List, in Effect July 22, 1903

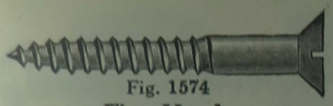


Fig. 1574

Flat Head

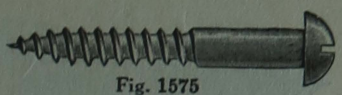


Fig. 1575

Round Head

NOS.	¼ Inch		⅜ Inch		½ Inch		⅝ Inch		¾ Inch		⅞ Inch	
	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross
0	.026	$0.72	.037	$0.72	....	$0.72	.....	.....	.....	.....	.....	.....
1	.039	.72	.055	.72	.069	.72	.084	$0.72	.....	.....	.....	.....
2	.056	.72	.077	.72	.098	.72	.118	.72	.137	$0.72	.155	$0.74
3	.076	.72	.104	.72	.130	.75	.156	.72	.180	.75	.203	.78
4	.099	.72	.133	.72	.165	.78	.160	.75	.230	.78	.265	.82
5	....	.....	.168	.75	.206	.80	.249	.78	.292	.82	.335	.85
6	....	.....	.203	.78	.256	.84	.309	.82	.362	.85	.415	.90
7	....	.....	.249	.82	.313	.90	.376	.86	.440	.90	.504	.94
8	....	.....	.301	.88	.376	.96	.451	.92	.527	.95	.602	1.00
9	....	.....	.386	.94	.446	1.05	.534	.98	.622	1.00	.710	1.05
10	....	.....	....	.....	.524	1.10	.625	1.07	.727	1.10	.828	1.15
11	....	.....	....	.....	.608	1.20	.724	1.12	.840	1.15	.957	1.25
12	....	.....	....	.....	.701	.....	.832	1.20	.964	1.25	1.095	1.35
13	....	.....	....	.....	....	.....	.949	1.25	1.097	1.35	1.245	1.45
14	....	.....	....	.....	....	.....	1.074	1.30	1.240	1.50	1.406	1.55
15	....	.....	....	.....	....	.....	.....	.....	1.393	1.65	1.578	1.75
16	....	.....	....	.....	....	.....	.....	.....	1.557	1.80	1.761	2.00

NOS.	1 Inch		1¼ Inches		1½ Inches		1¾ Inches		2 Inches		2¼ Inches		2½ Inches	
	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross
3	.230	$0.80	.315	$0.88	.....	$0.98	.....	.....	.....	.....	.....	.....	.....	.....
4	.299	.84	.368	.92	.437	1.05	.....	.....	.....	.....	.....	.....	.....	.....
5	.379	.87	.465	.98	.551	1.10	.649	$1.30	.760	$1.45	.....	$1.55	.....	$1.90
6	.468	.92	.573	1.05	.679	1.15	.785	1.35	.891	1.50	.....	1.60	.....	2.00
7	.567	.98	.694	1.10	.821	1.20	.949	1.45	1.076	1.55	.....	1.65	.....	2.10
8	.677	1.05	.828	1.15	.978	1.30	1.128	1.50	1.279	1.60	1.429	1.75	1.57	2.20
9	.798	1.10	.973	1.20	1.149	1.35	1.325	1.55	1.501	1.65	1.676	1.85	1.85	2.30
10	.930	1.20	1.132	1.30	1.335	1.40	1.538	1.60	1.741	1.75	1.944	1.95	2.14	2.40
11	1.073	1.30	1.305	1.40	1.537	1.50	1.769	1.70	2.001	1.85	2.233	2.05	2.47	2.50
12	1.227	1.40	1.490	1.55	1.753	1.65	2.017	1.80	2.280	2.00	2.543	2.20	2.81	2.60
13	1.393	1.60	1.690	1.70	1.985	1.80	2.282	2.00	2.578	2.20	2.875	2.35	3.17	2.70
14	1.571	1.70	1.903	1.90	2.234	2.00	2.565	2.25	2.897	2.45	3.228	2.65	3.56	2.90
15	1.762	2.00	2.130	2.15	2.498	2.35	2.867	2.60	3.235	2.75	3.603	3.10	3.97	3.30
16	1.965	2.50	2.372	2.50	2.779	2.80	3.187	2.90	3.594	3.10	4.001	3.50	4.41	3.65
17	2.180	2.70	2.628	2.75	3.076	3.20	3.525	3.50	3.973	3.70	4.421	3.85	4.87	4.20
18	2.408	2.80	2.899	3.30	3.391	3.80	3.882	4.00	4.373	4.20	4.864	4.55	5.36	4.70
20	2.905	3.50	3.488	4.00	4.070	4.30	4.653	4.50	5.236	4.80	5.818	5.30	6.40	5.80
22	.....	.....	4.138	4.80	4.820	5.10	5.502	5.20	6.184	5.50	6.867	6.10	7.55	6.70
24	.....	.....	4.852	5.40	5.642	5.90	6.431	6.00	7.221	6.40	8.010	6.90	8.80	7.50

NOS.	2¾ Inches		3 Inches		3½ Inches		4 Inches		4½ Inches		5 Inches		6 Inches	
	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt, Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross
6	.....	$2.40	.....	$2.95	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
7	.....	2.60	.....	3.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	.....	2.70	.....	3.05	.....	$3.90	.....	$4.90	.....	.....	.....	.....	.....	.....
9	.....	2.80	.....	3.10	.....	4.00	.....	5.10	.....	.....	.....	.....	.....	.....
10	2.3	2.90	2.6	3.15	3.0	4.10	.....	.....	.....	.....	.....	.....	.....	.....
11	2.6	3.00	2.9	3.20	3.4	4.20	.....	.....	.....	.....	.....	.....	.....	.....
12	3.1	3.10	2.3	3.30	3.9	4.30	4.4	5.40	.....	$7.00	.....	$8.10	.....	$10.00
13	3.5	3.20	3.8	3.40	4.4	4.40	.....	5.60	.....	7.20	.....	8.30	.....	10.30
14	3.9	3.30	4.2	3.50	4.9	4.50	5.5	5.90	.....	7.60	.....	8.60	.....	11.00
15	4.3	3.60	4.7	3.80	5.4	4.75	.....	6.20	.....	7.85	.....	9.10	.....	11.60
16	4.8	3.90	5.2	4.20	6.0	4.95	6.9	6.50	7.7	8.15	.....	9.70	.....	12.40
17	5.3	4.50	5.8	4.80	6.7	5.40	.....	7.00	.....	8.60	.....	.....	.....	13.00
18	5.8	5.00	6.3	5.50	7.3	6.15	8.3	7.60	9.3	9.15	10.3	11.00	.....	14.50
20	7.0	6.10	7.6	6.50	8.7	7.30	9.9	8.60	11.1	9.85	12.2	11.50	14.6	16.00
22	8.2	7.20	8.9	7.50	10.2	8.70	11.6	9.70	13.0	11.20	14.4	13.00	17.1	18.00
24	9.6	8.50	10.4	8.70	12.1	10.20	13.5	11.20	15.1	13.50	16.7	15.00	19.9	20.00
26	4.1	.....	12.0	10.50	13.8	12.00	15.6	14.00	17.4	16.00	19.2	18.00	22.8	23.00
28	.....	.....	.....	.....	.....	.....	.....	16.00	.....	18.50	21.9	21.00	26.0	27.00
30	.....	.....	.....	.....	.....	.....	.....	18.50	.....	21.50	.....	24.00	29.4	30.50

The following varieties of Iron Screws are invoiced from this list at varying discounts: Flat, Round, Fillister and Oval Head Screws, Dowel, Winged, Headless, Pinched, Bung Head and Felloe Screws, Bright, Blued, Nickel Plated, Silver Plated, Brassed, Bronzed, Coppered, Japanned, Lacquered, Tinned, and Galvanized, also Drive Screws.

¼ Inch to 3 Inch No. 16, One Gross in a Package; Larger Sizes, Half Gross in a Package

BRASS WOOD SCREWS

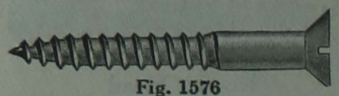


Fig. 1576

Flat Head

Manufacturers' Standard List, in Effect July 22, 1903

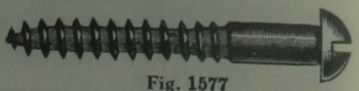


Fig. 1577

Round Head

NOS.	1/4 Inch		3/8 Inch		1/2 Inch		5/8 Inch		3/4 Inch		7/8 Inch	
	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross	Weight Per Gross, Lbs.	Per Gross
0	.028	$0.84	.039	$0.84	.....	.....	.....	.....	.....	.....	.....	.....
1	.042	.84	.058	.87	.075	$0.92	.091	$0.96	.....	.....	.....	.....
2	.060	.88	.083	.92	.106	.96	.127	1.00	.148	$1.12	.167	$1.40
3	.082	.92	.112	.97	.140	1.02	.168	1.08	.194	1.18	.216	1.50
4	.107	.97	.142	1.04	.178	1.08	.212	1.15	.248	1.25	.286	1.55
5	.....	1.04	.181	1.12	.222	1.20	.269	1.30	.315	1.40	.362	1.60
6	.....	.....	.219	1.20	.270	1.30	.334	1.40	.391	1.55	.448	1.65
7	.....	.....	.269	1.35	.337	1.45	.397	1.60	.475	1.75	.544	1.90
8	.....	.....	.321	1.50	.406	1.65	.487	1.85	.569	2.00	.650	2.20
9	.....	.....	.....	.....	.478	1.90	.577	2.10	.672	2.30	.767	2.50
10	.....	.....	.....	.....	.566	2.15	.675	2.40	.785	2.65	.894	2.90
11	.....	.....	.....	.....	.....	.....	.781	2.65	.907	3.00	1.03	3.35
12	.....	.....	.....	.....	.....	.....	.900	3.00	1.04	3.35	1.19	3.70
13	.....	.....	.....	.....	.....	.....	1.03	3.35	1.18	3.70	1.35	4.10
14	.....	.....	.....	.....	.....	.....	1.16	3.70	1.35	4.10	1.52	4.55
15	.....	.....	.....	.....	.....	.....	.....	4.10	1.50	4.55	1.71	5.05
16	.....	.....	.....	.....	.....	.....	.....	4.55	1.68	5.05	1.90	5.60

NOS.	1 Inch		1 1/4 Inches		1 1/2 Inches		1 3/4 Inches		2 Inches		2 1/4 Inches		2 1/2 Inches	
	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross
3	.248	$1.65	.336	$2.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	.323	1.70	.397	2.20	.468	$2.95	.....	.....	.....	.....	.....	.....	.....	.....
5	.409	1.75	.502	2.25	.595	3.05	.....	.....	.....	.....	.....	.....	.....	.....
6	.505	1.80	.619	2.35	.733	3.10	.848	$3.95	.962	$5.15	.....	.....	.....	.....
7	.612	2.10	.750	2.45	.887	3.20	1.02	4.00	1.17	5.20	.....	.....	.....	.....
8	.731	2.45	.894	2.85	1.06	3.30	1.22	4.10	1.38	5.25	1.54	$6.85	.....	.....
9	.862	2.80	1.05	3.20	1.24	3.65	1.43	4.20	1.62	5.30	1.81	6.95	1.98	$9.40
10	1.01	3.15	1.22	3.50	1.45	4.25	1.66	4.70	1.88	5.40	2.10	7.05	2.29	9.50
11	1.16	3.65	1.40	4.10	1.66	4.65	1.91	5.35	2.16	6.15	2.41	7.25	2.63	9.60
12	1.33	4.10	1.61	4.65	1.89	5.35	2.18	6.05	2.46	6.85	2.74	7.90	2.99	9.70
13	1.50	4.55	1.83	5.35	2.15	5.95	2.46	6.70	3.11	7.55	3.10	8.80	3.39	9.85
14	1.69	5.05	2.05	5.85	2.41	6.65	2.77	7.35	3.13	8.45	3.49	9.80	3.80	10.75
15	1.90	5.60	2.30	6.55	2.70	7.60	3.10	8.65	3.50	9.75	3.89	10.75	4.25	11.85
16	2.12	6.65	2.66	7.20	3.00	8.35	3.45	9.50	3.88	10.70	4.32	11.90	4.72	13.00
17	.....	.....	2.84	7.85	3.33	9.15	3.80	10.45	4.29	11.70	4.77	13.00	5.20	14.30
18	2.57	7.40	3.13	9.35	3.66	10.85	4.19	12.40	4.72	13.90	5.25	15.40	5.72	16.95
20	.....	.....	3.77	10.45	4.40	12.65	5.02	14.50	5.66	16.30	6.27	18.00	6.85	19.85
22	.....	.....	.....	.....	5.21	14.50	5.94	16.85	6.67	18.90	7.42	20.95	8.07	23.00
24	.....	.....	.....	.....	.....	.....	6.94	18.90	7.80	21.00	8.65	23.30	9.40	25.50

NOS.	2 3/4 Inches		3 Inches		3 1/2 Inches		4 Inches		4 1/2 Inches		5 Inches		6 Inches	
	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross	Wgt. Per Gross, Lbs.	Per Gross
9	.....	$11.50	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
10	2.6	11.65	2.9	$13.70	3.2	$15.85	.....	.....	.....	.....	.....	.....	.....	.....
11	2.9	11.80	3.1	13.85	3.7	16.00	.....	.....	.....	.....	.....	.....	.....	.....
12	3.3	11.95	3.6	14.00	4.2	16.15	4.8	$18.60	.....	.....	.....	.....	.....	.....
13	3.8	12.10	4.1	14.10	4.8	16.30	.....	18.80	.....	.....	.....	.....	.....	.....
14	4.1	12.25	4.5	14.30	5.3	16.45	5.9	19.00	.....	$22.60	.....	.....	.....	.....
15	4.6	13.00	5.1	14.60	5.8	16.60	.....	19.25	.....	22.80	.....	.....	.....	.....
16	5.2	14.20	5.6	15.40	6.5	17.70	7.5	20.35	8.3	23.40	.....	$26.90	.....	$31.00
17	5.7	15.65	6.3	16.80	7.2	19.40	.....	22.30	.....	25.75	.....	29.60	.....	34.05
18	6.2	18.40	6.8	19.95	7.9	22.75	9.0	26.90	10.1	30.90	11.1	35.50	.....	40.80
20	7.5	21.60	8.1	23.40	9.4	26.90	10.7	30.80	12.0	35.40	13.1	40.70	15.8	46.80
22	8.8	25.00	9.6	27.10	11.0	31.20	12.5	36.00	14.0	41.40	15.6	47.60	18.5	54.75
24	10.16	28.00	11.2	31.15	13.0	35.80	14.6	40.70	16.2	46.80	18.0	53.80	21.2	61.90
26	.....	.....	13.0	35.85	14.9	41.20	16.7	47.35	18.7	54.40	20.7	62.60	24.5	72.95
28	.....	.....	.....	41.15	.....	47.45	.....	54.55	.....	62.70	23.7	72.15	28.1	82.95
30	.....	.....	.....	47.45	.....	54.55	.....	62.70	.....	72.15	.....	82.95	31.8	93.35

The following varieties of screws are invoiced from this list at varying discounts: Flat, Round, Fillister and Oval Head Screws of Brass, Bronze, Metal, Nickel, and Silver Plated Brass.

Fig. 1578
Square-Blank

Fig. 1579
Square-Tapped

NUTS

Fig. 1580
Hexagon-Blank

Fig. 1581
Hexagon-Tapped

HOT PRESSED

United States Standard List Adopted March 1, 1911.

Size Bolt, Inches	Width, Inches	Thickness, Inches	Diam. Hole, Inches	SQUARE				HEXAGON			
				Average Number in 200 Lb. Keg		Per 100 Lbs. in 200 Lb. Kegs		Average Number in 200 Lb. Keg		Pe 00 Lbs. in 200 Lb. Kegs	
				Blank	Tapped	Blank	Tapped	Blank	Tapped	Blank	Tapped
1/4	1/2	1/4	3/16	13,800	14,760	$13.00	$15.00	17,400	18,600	$20.00	$22.50
5/16	19/32	5/16	1/4	7,400	7,915	12.00	13.50	9,200	9,760	18.00	20.00
3/8	11/16	3/8	19/64	5,000	5,320	10.50	11.60	6,000	6,400	14.00	15.60
7/16	25/32	7/16	11/32	3,200	3,400	10.00	10.90	4,000	4,250	13.00	14.30
1/2	7/8	1/2	13/32	2,400	2,540	9.00	9.70	3,000	3,200	11.20	12.20
9/16	31/32	9/16	29/64	1,600	1,690	9.00	9.60	2,128	2,275	11.20	12.10
5/8	1 1/16	5/8	33/64	1,360	1,440	8.70	9.20	1,540	1,630	10.50	11.20
3/4	1 1/4	3/4	5/8	832	880	8.50	8.90	998	1,050	10.00	10.60
7/8	1 7/16	7/8	47/64	544	578	8.40	8.80	628	665	9.90	10.50
1	1 5/8	1	27/32	376	397	8.40	8.80	436	460	9.90	10.50
1 1/8	1 13/16	1 1/8	15/16	268	284	8.40	8.80	288	305	9.90	10.50
1 1/4	2	1 1/4	1 1/16	206	220	8.40	8.80	250	260	9.90	10.50
1 3/8	2 3/16	1 3/8	1 5/32	146	157	8.50	9.00	182	190	10.00	10.70
1 1/2	2 3/8	1 1/2	1 9/32	120	127	8.80	9.40	144	150	10.30	11.10
1 5/8	2 9/16	1 5/8	1 13/32	95	100	9.00	9.70	116	120	10.50	11.40
1 3/4	2 3/4	1 3/4	1 1/2	74	77	9.30	10.00	95	100	10.80	11.70
1 7/8	2 15/16	1 7/8	1 5/8	64	67	9.50	10.30	80	84	11.00	12.00
2	3 1/8	2	1 23/32	53	56	9.70	10.60	62	65	11.20	12.30
2 1/8	3 5/16	2 1/8	1 13/16	43	45	10.00	11.00	52	54	11.70	12.90
2 1/4	3 1/2	2 1/4	1 15/16	36	37	10.00	11.10	44	46	11.70	13.00
2 3/8	3 11/16	2 3/8	2 1/16	28	29	10.30	11.50	35	36	12.20	13.60
2 1/2	3 7/8	2 1/2	2 11/64	24	25	10.50	11.80	32	37	12.40	13.90
2 3/4	4 1/4	2 3/4	2 27/64	21	22	11.00	12.40	27	27	13.00	14.60
3	4 5/8	3	2 5/8	16	17	11.50	13.00	18	18	13.50	15.20

COLD PUNCHED

CHAMFERED AND TRIMMED WITH REAMED HOLES

United States Standard List Adopted March 1, 1911

Size Bolt, Inches	Width, Inches	Thickness, Inches	Diam. Hole, Inches	SQUARE				HEXAGON			
				Average Number in 200 Lb. Keg		Per 100 Lbs. in 200 Lb. Kegs		Average Number in 200 Lb. Keg		Per 100 Lbs. in 200 Lb. Kegs	
				Blank	Tapped	Blank	Tapped	Blank	Tapped	Blank	Tapped
1/4	1/2	1/4	13/64	12,600	13,500	$20.00	$22.00	13,800	14,750	$27.00	$29.50
5/16	19/32	5/16	1/4	7,600	8,150	18.00	19.50	8,932	9,560	24.00	26.00
3/8	11/16	3/8	19/64	4,600	4,900	14.50	15.60	5,500	5,880	18.50	20.10
7/16	25/32	7/16	11/32	3,000	3,200	14.00	14.90	3,760	3,990	18.00	19.30
1/2	7/8	1/2	13/32	2,320	2,450	11.30	12.00	2,650	2,800	14.00	15.00
9/16	31/32	9/16	29/64	1,660	1,750	11.30	11.90	1,993	2,110	14.00	14.90
5/8	1 1/16	5/8	33/64	1,200	1,270	10.00	10.50	1,440	1,525	12.50	13.20
3/4	1 1/4	3/4	5/8	740	780	9.70	10.10	896	950	11.40	12.00
7/8	1 7/16	7/8	47/64	480	500	9.60	10.00	567	600	11.10	11.70
1	1 5/8	1	27/32	344	365	9.60	10.00	408	435	11.10	11.70
1 1/8	1 13/16	1 1/8	15/16	244	260	9.60	10.00	296	313	11.10	11.70
1 1/4	2	1 1/4	1 1/16	180	192	10.10	10.50	208	220	11.50	12.10
1 3/8	2 3/16	1 3/8	1 5/32	150	160	10.30	10.80	164	175	12.00	12.70
1 1/2	2 3/8	1 1/2	1 9/32	112	120	10.70	11.30	132	140	12.60	13.40
1 5/8	2 9/16	1 5/8	1 25/64	96	100	11.10	11.80	108	115	13.20	14.10
1 3/4	2 3/4	1 3/4	1 1/2	72	77	11.50	12.20	88	93	14.00	14.90
1 7/8	2 15/16	1 7/8	1 5/8	56	59	12.00	12.80	71	75	14.50	15.50
2	3 1/8	2	1 23/32	48	50	12.00	12.90	46	48	14.50	15.60
2 1/4	3 1/2	2 1/4	1 61/64	40	42	12.50	13.60	38	40	15.00	16.30
2 1/2	3 7/8	2 1/2	2 3/16	32	33	13.50	14.80	31	32	16.00	17.50
2 3/4	4 1/4	2 3/4	2 7/16	30	31	14.00	15.40	26	27	16.50	18.10
3	4 5/8	3	2 11/16	27	28	14.50	16.00	20	21	17.00	18.70
3 1/4	5	3 1/4	2 15/16	20	21	14.50	16.10	17	18	17.00	18.80
3 1/2	5 3/8	3 1/2	3 5/32	13	14	14.50	16.20	14	14	17.00	18.90
3 3/4	5 3/4	3 3/4	3 3/8	9	10	15.50	17.20	11	11	18.00	19.90
4	6 1/8	4	3 9/16	5	5	15.50	17.50	8	8	18.00	20.00

For less than Keg Lots (200 Lbs.) of a size—add $0.20 to List per cwt. for 100 Lbs. or over and $0.50 per cwt. for less than 100 Lbs.

MACHINE SCREW NUTS

Nuts are cold punched and tapped. Brass nuts have bright finish.

Fig. 1582

Adopted Jan. 1, 1901

SQUARE

NOS.	Threads, Per Inch	No. in Lb.	Iron, Per Gross	Brass, Per Gross
4	32, 36, 40	...	$0.23	$0.72
6	30, 32, 36	...	.23	.72
8	30, 32, 36	271	.26	.80
10	24, 30, 32	187	.29	.87
12	20, 24	152	.32	.94
14	18, 20, 24	130	.36	1.08
16	16, 18, 20	81	.48	1.44
18	16, 18, 20	55	.62	1.88
20	16, 18	48	.82	2.45
22	16, 18	38	.93	2.70
24	14, 16, 18	35	1.06	3.17
26	14, 16	25	1.20	3.60
28	14, 16	...	1.35	4.10
30	14, 16	...	1.50	4.55

Fig. 1583

HEXAGON

NOS.	Threads Per Inch	No. in Lb.	Iron Per Gross	Brass Per Gross
4	32, 36, 40	...	$0.36	$1.08
6	30, 32, 36	...	.36	1.08
8	30, 32, 36	271	.40	1.22
10	24, 30, 32	187	.43	1.30
12	20, 24	152	.48	1.44
14	18, 20, 24	130	.55	1.66
16	16, 18, 20	81	.72	2.16
18	16, 18, 20	55	.94	2.81
20	16, 18	48	1.22	3.67
22	16, 18	36	1.44	4.32
24	14, 16, 18	35	1.58	4.75
26	14, 16	25	1.80	5.40
28	14, 16	...	2.02	6.05
30	14, 16	...	2.30	6.91

SIZES OF MACHINE SCREW NUTS

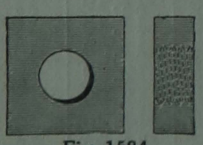


Fig. 1584

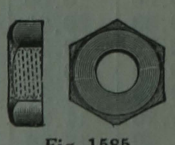


Fig. 1585

NOS.	Across Flats, Inch	Thickness, Inch	NOS.	Across Flats, Inch	Thickness, Inch
4	9/32	3/32	18	9/16	1/4
6	5/16	7/64	20	5/8	1/4
8	11/32	1/8	22	11/16	5/16
10	3/8	1/8	24	11/16	5/16
12	7/16	5/32	26	11/16	5/16
14	7/16	3/16	28	11/16	5/16
16	1/2	3/16	30	7/8	3/8

CASE HARDENED NUTS

HEXAGON

Fig. 1586
Plain

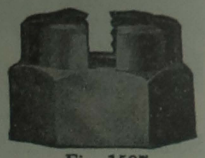


Fig. 1587
Castle

SEMI-FINISHED S. A. E. STANDARD

Dimensions adopted by Society of Automobile Engineers.

Diam. Screw, Inch	Pitch of Thread	Thickness Inches Plain	Thickness Inches Castle	Diam. Castle, Inches	Height Castle, Inches	Diam. Nut Across Flats Inches
1/4	28	7/32	9/32	7/16	3/32	7/16
5/16	24	17/64	21/64	1/2	3/32	1/2
3/8	24	21/64	13/32	9/16	1/8	9/16
7/16	20	3/8	29/64	5/8	1/8	5/8
1/2	20	7/16	9/16	3/4	3/16	3/4
9/16	18	31/64	39/64	7/8	3/16	7/8
5/8	18	35/64	23/32	15/16	1/4	15/16
11/16	16	19/32	49/64	1	1/4	1
3/4	16	21/32	13/16	1 1/16	1/4	1 1/16
7/8	14	49/64	29/32	1 1/4	1/4	1 1/4
1	14	7/8	1	1 7/16	1/4	1 7/16

Size, Inch	1/4	5/16	3/8	7/16	1/2	9/16
Plain, Each	$1.50	1.75	2.25	3.00	3.50	4.50
Castle, Each	1.50	1.25	2.25	3.00	3.50	4.50

Size, Inch	5/8	11/16	3/4	7/8	1
Plain, Each	$5.50	6.25	8.50	10.00	15.50
Castle, Each	5.50	6.25	8.50	10.00	15.50

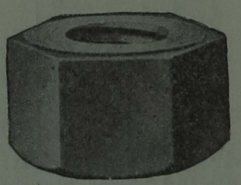


Fig. 1588
Semi-Finished

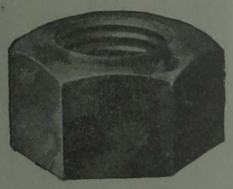


Fig. 1589
Finished

U. S. STANDARD

These nuts are milled from the bar to exact outside dimensions, tapped U. S. Standard thread, and faced off on the bottom at right angles to the thread.

Width, Inches	Number of Threads	Thickness, Inches	Size Bolt, Inches	Semi-Finished, Each	Finished and Case-hardened Each
3/8	24	3/8	3/16	$0.02	$0.06
1/4	20	1/2	1/4	.02	.06
5/16	18	19/32	5/16	.025	.07
3/8	16	11/16	3/8	.0325	.08
7/16	14	25/32	7/16	.0375	.09
1/2	12 or 13	7/8	1/2	.045	.10
9/16	12	31/32	9/16	.055	.12
5/8	11	1 1/16	5/8	.065	.16
11/16	11	1 5/32	11/16	.085	.22
3/4	10	1 1/4	3/4	.085	.22
7/8	9	1 7/16	7/8	.12	.27
1	8	1 5/8	1	.175	.38
1 1/8	7	1 13/16	1 1/8	.24	.50
1 1/4	7	2	1 1/4	.33	.66
1 3/8	6	2 3/16	1 3/8	.49	.90
1 1/2	6	2 3/8	1 1/2	.69	1.20
1 5/8	5 1/2	2 9/16	1 5/8	.93	1.45
1 3/4	5	2 3/4	1 3/4	1.30	1.75
1 7/8	5	2 15/16	1 7/8	1.70	2.50
2	4 1/2	3 1/8	2	2.15	3.25
2 1/4	4 1/2	3 1/2	2 1/4	3.10	5.50
2 1/2	4	3 7/8	2 1/2	4.70	5.80
2 3/4	4	4 1/4	2 3/4	6.30	12.00
3	3 1/2	4 5/8	3	9.90	158.00

WROUGHT WASHERS

Fig. 1590

U. S. STANDARD SIZES

Manufacturers' Standard List, in Effect January 20, 1910

Size Bolt, Inches	Size Hole, Inches	Diameter, Inches	Thickness, Wire Gauge Nos.	Number in 100, Lbs.	Per 100 Lb. in 200 Lb. Kegs
3/16	1/4	9/16	18	39,400	$14.00
1/4	5/16	3/4	16	15,600	12.20
5/16	3/8	7/8	16	11,250	11.40
3/8	7/16	1	14	6,800	10.50
7/16	1/2	1 1/4	14	4,300	9.80
1/2	9/16	1 3/8	12	2,600	9.40
9/16	5/8	1 1/2	12	2,250	9.30
5/8	11/16	1 3/4	10	1,300	9.20
3/4	13/16	2	9	900	9.10
7/8	15/16	2 1/4	8	782	9.00
1	1 1/16	2 1/2	8	568	9.00
1 1/8	1 1/4	2 3/4	8	473	9.00
1 1/4	1 3/8	3	8	364	9.20
1 3/8	1 1/2	3 1/4	7	275	9.20
1 1/2	1 5/8	3 1/2	7	156	9.20
1 5/8	1 3/4	3 3/4	7	220	9.50
1 3/4	1 7/8	4	7	197	9.50
1 7/8	2	4 1/4	7	174	9.50
2	2 1/8	4 1/2	7	160	9.50
2 1/4	2 3/8	4 3/4	5	122	10.50
2 1/2	2 5/8	5	4	106	10.50

The above list prices apply only to full keg lots (200 Lbs.) of a Size. For less than full keg lots of a size, the following extras will be charged.

$0.10 per 100 Lbs. for Packing in 100 Lb. Kegs.
.20 per 100 Lbs. for Packing in 50 to 100 Lb. Boxes.
.30 per 100 Lbs. for Packing in 25 to 50 Lb. Boxes.
.50 per 100 Lbs. for Packing in 5 Lb. Boxes.
1.00 per 100 Lbs. for Packing in 1 Lb. Boxes.

CAST WASHERS

Fig. 1591

GOVERNMENT O. G. STANDARD

Size Bolt, Inches	Size Hole, Inches	Diameter, Inches	Thickness, Inches	Weight Each, Lbs.
1/2	5/8	2 1/4	11/16	1/2
5/8	3/4	2 3/4	3/4	5/8
3/4	7/8	3	13/16	3/4
7/8	1	3 1/2	7/8	1 1/4
1	1 1/8	4	15/16	1 5/8
1 1/8	1 1/4	4 1/2	1	2 1/4
1 1/4	1 3/8	5	1 1/8	3
1 1/2	1 3/4	6	1 1/4	5

Prices on Application

LOCK WASHERS

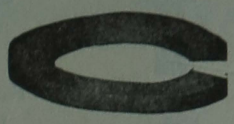


Fig. 1592

PLAIN

Made of high-grade spring steel. Prevents nut from loosening, caused by jarring and friction.

Size Bolt, Inches	Size, Steel, Inches Width	Thickness	Weight Per 1000, Lbs.	Per Thousand
3/16	1/8	1/16	2 1/2	$3.00
1/4	1/8	1/16	2 1/2	3.70
5/16	1/8	1/16	3	4.35
3/8	1/8	1/16	3 1/2	5.00
7/16	5/32	1/16	5	6.35
1/2	3/16	3/32	11	9.00
5/8	1/4	1/8	25	15.00
3/4	1/4	1/8	27	17.00
7/8	1/4	3/16	50	22.00
1	1/4	1/4	72	27.35
1 1/8	3/8	1/4	120	40.35
1 1/4	5/16	1/4	103	39.70
1 3/8	3/8	1/4	145	47.70
1 1/2	3/8	1/4	166	54.35

Fig. 1593

POSITIVE

Positive lock washers are so constructed that the body of the washer carries the load of compression. The tapered ends are thus relieved, and the spring is constant. The barbs being free to move when subjected to vibration, force themselves deeply into the nut and metal backing. Washers are reversible and can be used many times. Do not injure the nut, its threads or the threads on the bolt.

Size Bolt, Inches	Size Steel, Inches Width	Thickness	Weight Per 1000, Lbs.	Per Thousand
3/16	1/8	1/16	2 1/2	$4.70
1/4	1/8	1/16	2 1/2	5.35
5/16	1/8	1/16	3	6.00
3/8	1/8	1/16	3 1/2	6.70
7/16	5/32	1/16	5	8.00
1/2	3/16	3/32	11	10.70
5/8	1/4	1/8	25	16.70
3/4	1/4	1/8	27	19.00
7/8	1/4	3/16	50	24.00
1	1/4	1/4	72	29.35
1 1/8	3/8	1/4	120	43.70
1 1/4	5/16	1/4	103	42.35
1 3/8	3/8	1/4	145	51.00
1 1/2	3/8	1/4	166	58.35

One Thousand in a Box

IRON RIVETS

Fig. 1594
Steeple Head

Fig. 1595
Cone Head

Fig. 1596
Flat Head

Fig. 1597
Countersunk Head

Fig. 1598
Bung Head

Fig. 1599
Wagon Box Head

Fig. 1600
Truss Hoop Head

Price per Pound in 5 and 10 Pound Boxes

List of January 8, 1904, Revised, March 19, 1913

Size Wire	Length, Inches																	
	1 and Longer	7/8	3/4	5/8	1/2	15/32	7/16	13/32	3/8	11/32	5/16	9/32	1/4	7/32	3/16	5/32	1/8	3/32
7/16	$.19	$.19	$.19½	$.20	$.20	$.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
3/8	.19	.19½	.19½	.20	.20	$.21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
11/32	.19½	.19½	.20	.20½	.20½	.21	$.21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
5/16	.19½	.20	.20	.20½	.20½	.21	.22	$.22	$.22	$.22	.....	.....	.....	.....	.....	.....	.....	.....
1	.20	.20½	.20½	.21	.21	.22	.23	.23	.23	$.23	.....	.....	.....	.....	.....	.....	.....	.....
2	.20	.20½	.20½	.21	.21	.22	.23	.23	.23	.23	$.24	.....	.....	.....	.....	.....	.....	.....
3	.20	.20½	.20½	.21	.21	.22	.23	.23	.23	.23	.24	$.24	$.24	.....	.....	.....	.....	.....
1/4	.20	.20½	.20½	.21	.21	.22	.23	.23	.23	.23	.24	.24	.24	$.25	$.25	.....	.....	.....
4	.21	.21½	.21½	.22	.22	.23	.23	.24	.24	.24	.24	.24	.24	.25	.25	$.26	.....	.....
5	.21	.21½	.21½	.22	.22	.23	.24	.24	.24	.24	.25	.26	.26	.27	.27	.28	$.28	$.29
6	.21	.21½	.21½	.22	.22	.23	.24	.24	.25	.25	.26	.26	.27	.28	.29	.29	.29	.30
3/16	.21	.21½	.21½	.22	.22	.23	.24	.24	.25	.25	.26	.26	.27	.28	.29	.30	.31	.32
7	.21	.21½	.22	.23	.23	.24	.24	.24	.25	.25	.26	.26	.27	.28	.29	.30	.31	.32
8	.22	.22½	.22½	.23	.23	.24	.25	.25	.26	.26	.27	.27	.28	.29	.30	.31	.32	.33
9	.23	.23½	.23½	.24	.24	.25	.26	.26	.27	.27	.29	.29	.29	.30	.31	.33	.35	.36
10	.24	.24½	.24½	.25	.25	.26	.27	.28	.29	.31	.33	.34	.34	.36	.39	.41	.43	.44
11	.25	.25½	.25½	.26	.26	.28	.30	.32	.33	.34	.36	.37	.37	.39	.43	.46	.48	.51
12	.26	.26½	.26½	.27	.27	.30	.32	.34	.35	.36	.38	.40	.41	.42	.47	.51	.56	.61
13	.30	.30½	.30½	.31	.31	.33	.36	.39	.40	.41	.43	.45	.46	.47	.51	.56	.61	.66
14	.32	.32½	.32½	.33	.33	.36	.41	.44	.46	.51	.56	.58	.61	.64	.64	.66	.69	.71

Rivets made from smaller wire than No. 14, all lengths, list $0.80 per pound; 3/32-inch diameter, list price of No. 13; 1/8-inch diameter, list price of No. 11; 5/32-inch diameter, list price of No. 8; 7/32-inch diameter, list price No. 5; 9/32-inch diameter, list price of No. 2.

List extras: For shoulder and pointed rivets, add $0.02 per pound to list price for each specialty, except pointed hame, caster and sucker rod. Intermediate lengths and diameters, list prices of nearest smaller size.

Net extras: For tin or copper plating, add $0.01½ per pound to net price; for metallic tinning, add $0.03½ per pound to net price. When " tinned " rivets are ordered, metallic tinned are furnished. For bright polishing rivets after annealing, add $0.25 net extra per cwt.

List rebates: For 25 and 50-pound boxes, deduct $0.02; for 100 and 200-pound kegs, deduct $0.04 per pound from list price.

BOILER SHIP AND STRUCTURAL RIVETS

LIST OF BASE SIZES AND EXTRAS

These Sizes take Base Price—In Kegs of About 200 Pounds

Boiler Rivets, Standard Heads.....3/4 to 1¼-inch Diameter, Inclusive. 2 to 5 inches in Length, Inclusive.
Structural Rivets, Standard Heads....3/4 to 1¼-inch Diameter, Inclusive. 2 to 5 inches in Length, Inclusive.
Boiler Rivets, Straight Necks.....3/4 to 1¼-inch Diameter, Inclusive. 2 to 5 inches in Length, Inclusive.

STANDARD EXTRAS

	Per 100 Lbs.
½ and 9/16-inch Diameter	$0.50
5/8 and 11/16-inch Diameter	.15
Larger than 1¼-inch Diameter	.25
Lengths, 1 inch and shorter	.50
Lengths between 1 and 2 inches	.25
Lengths over 5 inches	.25
All Standard Countersunk Head Rivets	.25
Rivets, Swell Necks	.25
Annealing Cold-made Rivets, 1½ inch Diameter and Larger	.35

TRACK SPIKES

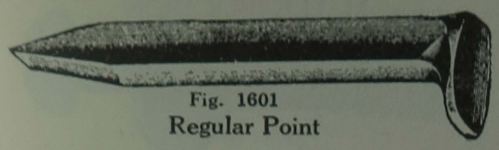


Fig. 1601
Regular Point

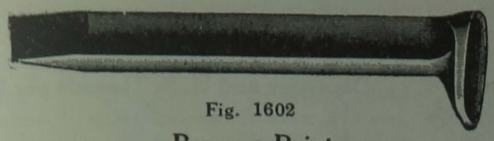


Fig. 1602
Reverse Point

Have a sharp well-finished point; drive easily and hold well after being driven; head will not fly off.

Size Under Head, Inches	Approx. Number per Keg	Ties 2 Feet Between Centers; 4 Spikes per Tie Makes per Mile, Lbs.	Kegs	Rail Used, Weight per Yard, Pounds
5½x9/16	360	5870	29⅓	45 to 70
5 x9/16	400	5170	26	40 to 56
5 x½	450	4660	23⅓	35 to 40
4½x½	530	3960	20	28 to 35
4 x½	600	3520	17⅔	24 to 35
4½x7/16	680	3110	15½	20 to 30
4 x7/16	720	2940	14¾	20 to 30
3½x7/16	900	2350	11¾	16 to 25
4 x⅜	1000	2090	10½	16 to 25
3½x⅜	1190	1780	9	16 to 20
3 x⅜	1240	1710	8	16 to 20
2½x⅜	1342	1575	7⅞	12 to 16

EXTRAS OVER BASE

4½ to 5x9/16 inch	Base
3 to 5x½ inch	$0.10
2½x½ inch	.20
3½ to 4½x7/16 inch	.20
3x7/16 inch	.30
3 to 4½x⅜ inch	.30
2½x⅜ inch	.40
2 x⅜ inch	.50
2½ to 4x5/16 inch	.60
2 x5/16 inch	.80
3 x¼ inch	.85
2 to 2½x¼ inch	1.00

Reversed points, ¼ cent per pound extra.

STEEL WIRE SPIKES

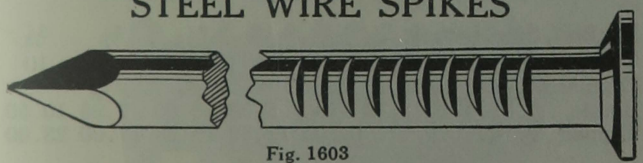


Fig. 1603
Flat Head—Diamond Point

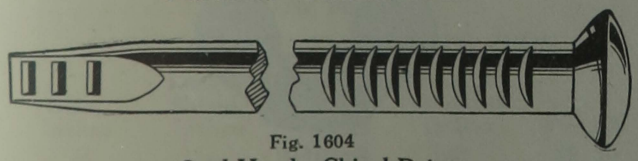


Fig. 1604
Oval Head—Chisel Point

Length, Inches	Diameter, Inches	Approx. Number to Lb.	Extra Over Base, per 100 Lbs.
7	5/16	7	$0.10
8	⅜	4	.10
9	⅜	3½	.10
10	⅜	3	.25
12	⅜	2½	.25

BOAT SPIKES

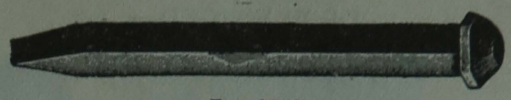


Fig. 1605

GALVANIZED
SPIKES TO 200 POUND KEG

Square Diameter, Inches	Length, Inches 3	4	5	6
½	....	....	....	450
7/16	....	....	....	600
⅜	1320	1140	940	800
5/16	1660	1360	1230	1175
¼	3000	2375	2050	1825

Square Diameter, Inches	Length, Inches 7	8	9	10
⅝	.....	260	240	220
½	375	335	300	275
7/16	590	510	400	360
⅜	650	600	525	475
5/16	990	880	....	....

Square Diameter, Inches	Length, Inches 11	12	14	16
⅝	205	190	175	160
½	260	240	....	....
7/16	320	230	....	....

EXTRAS OVER BASE — Per 100 Lbs.

8 to 14 x⅝ inch	$0.15
6 to 12 x½ inch	.15
6 to 12 x7/16 inch	.20
4 to 12 x⅜ inch	.30
3 to 3½x⅜ inch	.55
4 to 8x5/16 inch	.45
3½x5/16 inch	.70
4 to 8x¼ inch	.75
3 to 3½x¼ inch	1.00

BARBED CAR NAILS

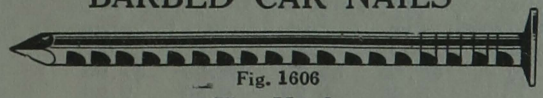


Fig. 1606
Flat Head

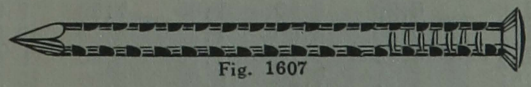


Fig. 1607
Oval Head

HEAVY OR LIGHT

Size	Length, Inches	Wire Number Heavy	Wire Number Light	Approx. Number to Lb. Heavy	Approx. Number to Lb. Light	Extra Over Base per 100 Lbs.
4	1½	10	12	165	274	$0.45
5	1¾	9	10	118	142	.45
6	2	9	10	103	124	.35
7	2¼	8	9	76	92	.35
8	2½	8	9	69	82	.25
9	2¾	7	8	54	62	.25
10	3	7	8	50	57	.20
12	3¼	6	7	42	50	.20
16	3½	6	7	35	43	.20
20	4	5	6	26	31	.15
30	4½	5	6	24	28	.15
40	5	4	5	18	21	.15
50	5½	3	4	15	17	.15
60	6	3	4	13	15	.15

In ordering, specify whether light or heavy, annealed or bright, oval or flat head are wanted.

THUMB SCREWS

DROP FORGED

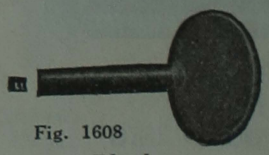


Fig. 1608 Blank

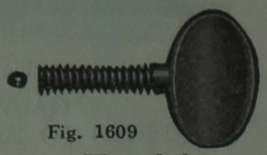


Fig. 1609 Threaded

BLANK—PRICE PER HUNDRED

Length Under Head, Inches	—Dia., Ins., and U. S. Threads per Inch— 1/8 32	3/16 24	1/4 20	5/16 18	3/8 16
1/4	$3.40	$3.70	$4.00	$4.50	$5.10
1/2	3.55	3.85	4.15	4.65	5.25
3/4	3 70	4.00	4.30	4.80	5.40
1	3.85	4.15	4.45	4.95	5.55
1 1/4	4.00	4.30	4.60	5.10	5.70
1 1/2	4.15	4.45	4.75	5.30	5.90
1 3/4	....	4.60	4.90	5.50	6.10
2	....	4.80	5.10	5.70	6.30
2 1/4	....	....	5.30	5.90	6.50
2 1/2	....	....	5.50	6.10	6.70
2 3/4	....	....	5.70	6.30	6.95
3	....	....	5.90	6.50	7.20
3 1/2	....	....	....	6.90	7.70
4	....	....	....	7.30	8.30

Length Under Head, Inches	—Dia., Ins., and U. S. Threads per Inch— 7/16 14	1/2 13	9/16 12	5/8 11	3/4 10
1/2	$6.00	$7 00	$9.00	....	....
1/2	6.20	7.20	9.25	....	....
1	6.40	7.40	9.55	$12.25	$20.00
1 1/4	6.60	7.65	9.90	12.75	20.50
1 1/2	6.85	7.90	10.30	13.30	21.05
1 3/4	7.10	8.20	10.75	13.90	21.70
2	7.35	8.50	11.25	14.55	22.45
2 1/4	7 65	8.85	11.80	15.25	23.20
2 1/2	7.95	9.20	12.40	16.00	24.20
2 3/4	8.25	9.60	13.05	16.80	25.20
3	8.60	10.10	13.75	17.65	26.35
3 1/2	9.30	11.30	15.15	19.45	28.75
4	10.20	12.80	17.00	22.00	31.80

THREADED—PRICE PER HUNDRED

Length Under Head, Inches	—Dia., Ins., and U. S. Threads per Inch— 1/8 32	3/16 24	1/4 20	5/16 18	3/8 16
1/4	$5.40	$5.70	$6.25	$7.00	$8.10
1/2	5.65	5.95	6.50	7.25	8.35
3/4	5.90	6.20	6.75	7.50	8.60
1	6.20	6.50	7.05	7.80	8.90
1 1/4	6.50	6.80	7.35	8.10	9.20
1 1/2	6.85	7.15	7.70	8.50	9.60
1 3/4	....	7.50	8.05	8.95	10.05
2	....	7.95	8.50	9.40	10.50
2 1/4	....	....	8.95	9.85	11.00
2 1/2	....	....	9.40	10.30	11.50
2 3/4	....	....	9.85	10.80	12.05
3	....	....	10.30	11.30	12.60
3 1/2	....	....	....	12.30	13.70
4	....	....	....	13.35	15.00

Length Under Head, Inches	—Dia., Ins., and U. S. Threads per Inch— 7/16 14	1/2 13	9/16 12	5/8 11	3/4 10
1/2	$9.60	$11.30	$14.75	....	....
3/4	9.95	11.65	15.15	....	....
1	10.35	12.05	15.65	$20.05	$31.00
1 1/4	10.80	12.55	16.30	20.85	31.80
1 1/2	11.35	13.10	17.00	21.70	32.70
1 3/4	11.90	13.75	17.75	22.60	33.75
2	12.45	14.40	18.65	23.65	34.95
2 1/4	13.05	15.10	19.60	24.80	36.20
2 1/2	13.68	15.80	20.60	26.00	37.80
2 3/4	14.25	16.55	21.65	27.25	39.50
3	14.90	17.40	22.75	28.60	41.35
3 1/2	16.30	19.45	25.05	31.55	45.35
4	18.00	22.05	28.00	35.50	50.20

THUMB SCREWS

MALLEABLE IRON

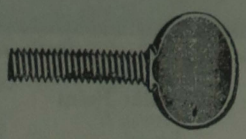


Fig. 1610

PRICE PER HUNDRED

Length Under Head, Inches	—Diameter and U. S. Threads per Inch— 1/8 40	3/16 24	1/4 20
1/2	$2.10	$1.20	$1.50
3/4	2.60	1.45	1.80
1	3.10	1.70	2.10
1 1/4	....	1.95	2.40
1 1/2	....	2.20	2.70
2	....	2.80	3.30
2 1/2	....	....	4.30
3	....	....	5.30

Length Under Head, Inches	—Diameter and U. S. Threads per Inch— 5/16 18	3/8 16	7/16 14	1/2 12 or 13
1/2	$2.00	$2.70	....	....
3/4	2.35	3.00	....	....
1	2.70	3.40	$4.60	$5.80
1 1/4	3.05	3.80	5.20	6.50
1 1/2	3.40	4.20	5.80	7.20
2	4.10	5.00	7.00	8.60
2 1/2	5.20	6.20	8.60	10.40
3	6.30	7.40	10.20	12.20

WING NUTS

Fig. 1611

Fig. 1612

DROP FORGED—PRICE PER HUNDRED

U. S. Standard Threads

For Bolt, Size, Inches	1/8	3/16	1/4	5/16	3/8
Threads per Inch	32	24	20	18	16
Diameter Top, Inches	1/4	5/16	3/8	7/16	17/32
Blank	$1.75	2.00	2.25	2.60	3.25
Tapped	4.50	5.00	5.50	6.50	8.00

For Bolt, Size, Inches	7/16	1/2	9/16	5/8	3/4
Threads per Inch	14	13	12	11	10
Diameter Top, Inches	5/8	21/32	3/4	13/16	15/16
Blank	$ 4.00	5.00	6.00	7.25	10.50
Tapped	10.00	12.50	15.00	17.00	23.00

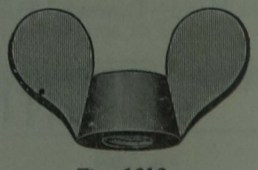


Fig. 1613

MALLEABLE IRON—PRICE PER HUNDRED

Diameter, Inches	1/8	3/16	1/4	5/16
Threads per Inch	32	24	20	18
Threaded	$2.40	1.10	1.30	1.60

Diameter, Inches	3/8	7/16	1/2	5/8
Threads per Inch	16	14	12 or 13	11
Threaded	$2.15	2.75	3.70	6.00

SCREW ANCHORS

Fig. 1614

Non-rusting composition metal; one piece construction; used with wood or machine screws. Shield when expanded will not chip marble or tile.

Size Anchor, Inches	For Use with Screws Nos.	Length Anchor, Inches	Outside Diam., Inches	Wgt. per 100 Lbs.	Per 100
1/8x 3/4	5, 6, 7, 8	3/4	1/4	11	$4.40
3/16x 3/4	9, 10, 11	3/4	5/16	22	5.00
3/16x1	9, 10, 11	1	5/16	22½	5.00
1/4x 3/4	12, 13, 14	3/4	7/16	33	5.60
1/4x1	12, 13, 14	1	7/16	44	5.60
1/4x1½	12, 13, 14	1½	7/16	66	6.75
5/16x1	15, 16, 17, 18	1	7/16	33¼	6.25
5/16x1½	15, 16, 17, 18	1½	7/16	55	7.50

EXPANSION SHIELDS

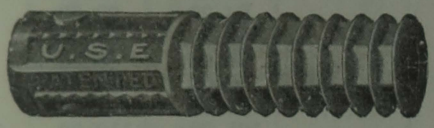


Fig. 1615

OPEN BACK

Two parts, malleable iron, same diameter on both ends, giving an even and firm grip when expanded; consists of case and nut.

Size Bolt for Case, Inches	Length Case, Inches	Diam. Case, Inches	Weight Per 100 Lbs.	Number in a Package	Per 100
1/4	1½	5/8	3¾	100	$9.00
5/16	1¾	5/8	5¼	100	9.50
3/8	2⅛	¾	7⅛	100	12.50
7/16	2½	⅞	9½	50	16.00
1/2	2¾	1	9¼	50	21.00
5/8	3¼	1⅛	6¾	25	27.00
3/4	3¾	1⅜	14½	25	39.00
7/8	4¼	1½	.....	25	52.00

MACHINE BOLT SHIELDS

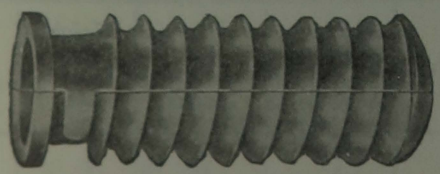


Fig. 1616

CLOSED BACK—MALLEABLE IRON

Size, Inches	Length Shield, Inches	Size Drill Required, Inches	Number Quantity in Box	Per 100
1/4	1½	5/8	100	$8.50
5/16	1¾	5/8	100	9.00
3/8	2⅛	¾	100	12.00
7/16	2½	⅞	50	15.00
1/2	2¾	1	50	19.00
5/8	3¼	1⅛	25	25.00
9/16	3¼	1⅛	25	25.00
3/4	3¾	1⅜	25	36.00
7/8	4¼	1½	25	48.00
1	4¾	1⅝	25	60.00

EXPANSION SHIELDS

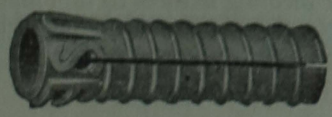


Fig. 1617

TWO-WAY—OPEN BACK

Malleable iron, in two parts; for use with machine bolts

Size, Inches	Length Shield, Inches	Size Drill Required, Inches	Number in Box	Per 100
5/16	1½	9/16	100	$9.50
3/8	1¾	5/8	100	12.50
7/16	2¼	⅞	50	16.00
1/2	2½	⅞	50	21.00
5/8	2¾	1	25	27.00
3/4	3¼	1¼	25	39.00
7/8	4¼	1½	25	52.00
1	4¾	1⅝	25	65.00

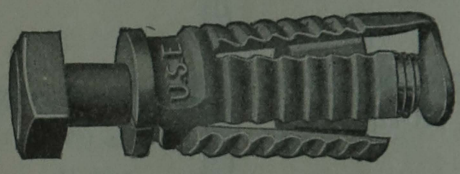


Fig. 1618

FOUR-WAY—OPEN BACK

For use on machine bolts, malleable iron in two parts.

Size, Inches	Length Shield, Inches	Size Drill Required, Inches	Number in Box	Per 100
1/4	...	1/2	100	$9.00
5/16	1½	9/16	100	9.50
3/8	1¾	5/8	100	12.50
1/2	2¼	⅞	50	21.00
5/8	2¾	1	25	27.00
3/4	3¼	1¼	25	39.00

Fig. 1619

DOUBLE EXPANSION—FOR MACHINE BOLTS

Wedge nut supports shield at every point; malleable iron.

Size, Inches	Length Shield, Inches	Size Drill Required, Inches	Number in Box	Per 100
1/4	1½	1/2	100	$9.00
5/16	1¾	9/16	100	11.00
3/8	2¼	5/8	100	13.00
1/2	3	⅞	50	18.00
5/8	3½	1	25	24.00
3/4	4	1¼	25	36.00
7/8	....	1½	25	60.00
1	....	1¾	25	65.00

Note.—Prices and Discounts apply to Shells and Anchors only.

TOGGLE BOLTS

Designed for securing fixtures to thin material in which a nail or a screw would not hold; made of best material; head riveted on.

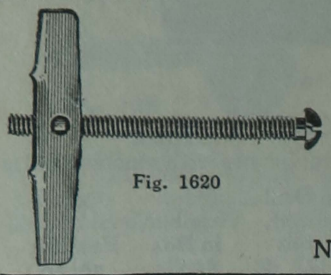


Fig. 1620

WITH ROUND OR FLAT HEAD IRON MACHINE SCREWS

NO. 1

Length, Ins.	Weight per 100, Lbs. Diam. Screw, Ins.			Per 100 Diam. Screw, Ins.		
	1/8	3/16	1/4	1/8	3/16	1/4
3	3	5	7	$7.50	$9.00	$10.00
4	4	6	8	8.50	10.00	11.00
5	5	7	9	9.50	11.00	12.00
6	6	8	10	10.50	12.00	13.00

WITH SQUARE NUTS

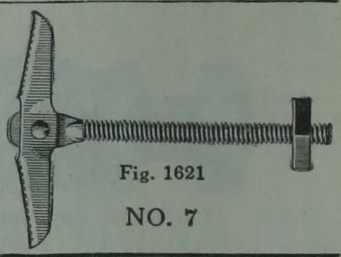


Fig. 1621

NO. 7

Length, Ins.	Weight per 100, Lbs. Diam. Screw, Ins.			Per 100 Diam. Screw, Ins.		
	1/8	3/16	1/4	1/8	3/16	1/4
3	3	5	7	$6.00	$7.50	$8.50
3 1/2	3 1/2	5 1/2	7 1/2	6.25	8.00	9.00
4	4	6	8	6.75	8.50	9.05
5	5	7	9	7.50	9.25	10.25
6	6	8	10	8.00	10.00	11.00

DRILL POINTS AND HOLDERS

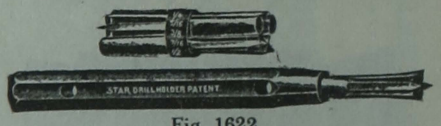


Fig. 1622

Invaluable where a number of small holes are to be drilled. All sizes have uniform tapered shanks which fit the tapered bore in the holder. Made of the best tool steel. Finely tempered and finished.

STAR DRILL POINTS

NOS.	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
1	1/4	1	$8.50
2	9/32	1	8.50
3	19/64	1	8.50
4	5/16	1	8.50
5	3/8	1 1/4	8.50
6	13/32	1 1/4	9.00
7	27/64	1 1/4	9.00
8	7/16	1 1/2	9.00
9	1/2	3 1/4	10.00
10	5/8	5	12.00
11	3/4	6	14.00

HOLDERS	Per Dozen
NO. 100—Fit all Drills	$24.00

STAR DRILLS

Fig. 1623

Octagon tool steel with forged points for drilling holes in concrete.

Diameter, Inches	Length, Inches 8 Per Dozen	12 Per Dozen	18 Per Dozen	24 Per Dozen
1/4	$8.25	$8.50	$11.00	$13.50
5/16	8.25	8.50	11.00	13.50
3/8	8.25	8.50	11.00	13.50
7/16	8.70	9.00	11.50	14.00
1/2	9.65	10.00	12.50	15.00
5/8	11.65	12.00	15.00	17.50
3/4	13.70	14.00	17.50	20.00
7/8	15.30	16.00	20.00	22.50
1	17.00	18.00	22.50	25.00
1 1/8	.....	24.00	28.00	32.00
1 1/4	.....	30.00	35.00	40.00
1 3/8	.....	40.00	45.00	50.00
1 1/2	.....	50.00	56.00	62.00
1 3/4	.....	75.00	81.00	87.00
2	.....	105.00	112.00	120.00
2 1/4	.....	135.00	145.00	165.00
2 1/2	.....	165.00	175.00	195.00

BRICK DRILL HEADS

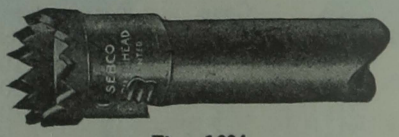


Fig. 1624

The drill heads are threaded to fit gas pipe, which serves as a handle. The heads are of strong, yet light construction, making them ideal for carrying in a tool kit. Quite a range of sizes can be carried as they weigh practically nothing.

NOS.	Diameter Cutting Edge, Inches	Pipe for Handle, Inches	Weight Per Dozen, Lbs.	Per Dozen
2	5/8	1/8	1	$6.00
3	3/4	1/4	1	6.00
4	7/8	3/8	1	6.00
5	1	1/2	1	6.00
5A	1 1/8	1/2	1 1/4	7.20
6	1 1/4	3/4	1 3/4	8.40
6A	1 3/8	3/4	2 1/2	15.00
7	1 1/2	3/4	3 1/4	18.00
7A	1 3/4	1	5	21.00
8	2	1	6	24.00
9	2 1/4	1	7 1/2	36.00
9A	2 1/2	1	11	44.00
10	2 3/4	1	12	54.00
10A	3	1	12	62.00
11	3 1/4	1 1/4	12	72.00
11A	3 1/2	1 1/4	13	80.00
11B	3 3/4	1 1/4	18	88.00
12	4	1 1/4	21	96.00

TURNBUCKLES

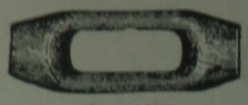


Fig. 1625

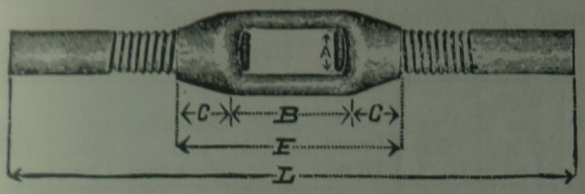


Fig. 1626

Drop forged from one piece of steel, insuring reliability and strength.

The same list prices apply to turnbuckles, either with or without stubs.

Diameter Screw, Inches	Length of Opening, Inches 3 Each	6 Each	9 Each	12 Each	15 Each
1/4	$0.36	....	....	....	....
5/16	.38	....	....	....	....
3/8	.40	$0.40	....	....	....
7/16	.42	.42	....	....	....
1/2	.45	.45	$0.56	$0.68	$0.90
9/16	.48	.48	.60	.72	.96
5/8	.50	.50	.63	.75	1.00
3/4	.63	.63	.79	.95	1.26
7/8	.75	.75	.94	1.13	1.50
1	.88	.88	1.10	1.32	1.76
1 1/8	1.00	1.00	1.25	1.50	2.00
1 1/4	1.25	1.25	1.56	1.88	2.50
1 3/8	....	1.38	1.73	2.07	2.76
1 1/2	....	1.50	1.88	2.25	3.00
1 5/8	....	1.75	2.19	2.63	3.50
1 3/4	....	2.00	2.50	3.00	4.00
1 7/8	....	2.25	2.81	3.38	4.50
2	....	2.65	3.31	3.98	5.30
2 1/4	....	3.50	4.38	5.25	7.00
2 1/2	....	4.50	5.63	6.75	9.00

Diameter Screw, Inches	Length of Opening, Inches 18 Each	24 Each	36 Each	48 Each	72 Each
5/8	$1.25	$1.75	....	....	....
3/4	1.58	2.20	....	....	....
7/8	1.88	2.62	....	....	....
1	2.20	3.08	$3.52	....	....
1 1/8	2.50	3.50	4.00	$6.00	$8.00
1 1/4	3.13	4.37	5.00	7.50	10.00
1 3/8	3.45	4.83	5.52	8.28	11.04
1 1/2	3.75	5.25	6.00	9.00	12.00
1 5/8	4.38	6.12	7.00	10.50	14.00
1 3/4	5.00	7.00	8.00	12.00	16.00
1 7/8	5.63	7.87	9.00	13.50	18.00
2	6.63	9.27	10.60	15.90	21.20
2 1/4	8.75	12.25	14.00	21.00	28.00
2 1/2	11.25	15.75	18.00	27.00	36.00

TURNBUCKLES

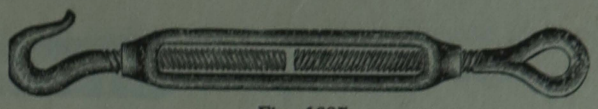


Fig. 1627

With Threaded Hook and Eye Bolts

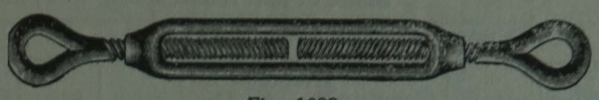


Fig. 1628

With Threaded Eye Bolts

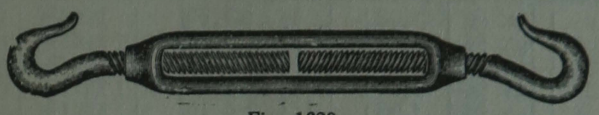


Fig. 1629

With Threaded Hook Bolts

List prices are the same for any of the three styles of turnbuckles illustrated.

BLACK OR GALVANIZED

Diameter Screw, Inches	Length of Opening, Inches 3 Each	6 Each	9 Each	12 Each	15 Each
1/4	$0.40	....	....	....	....
5/16	.45	....	....	....	....
3/8	.65	$0.65	....	....	....
7/16	.72	.72	....	....	....
1/2	.72	.72	$0.85	$0.95	$1.15
9/16	.80	.80	.95	1.05	1.30
5/8	.80	.80	.95	1.05	1.30
3/4	1.10	1.10	1.25	1.40	1.70
7/8	1.35	1.35	1.55	1.70	2.10
1	1.65	1.65	1.85	2.05	2.50
1 1/8	2.10	2.10	2.35	2.55	3.05
1 1/4	2.65	2.65	2.95	3.25	3.90
1 3/8	....	3.15	3.45	3.80	4.50
1 1/2	....	3.70	4.05	4.45	5.20
1 5/8	....	4.65	....	5.50	6.40
1 3/4	....	5.40	....	6.40	7.40
1 7/8	....	6.50	....	7.60	8.75
2	....	7.75	....	9.10	10.40

Diameter Screw, Inches	Length of Opening, Inches 18 Each	24 Each	36 Each	48 Each	72 Each
5/8	$1.55	$2.05	....	....	....
3/4	2.00	2.65	....	....	....
7/8	2.45	3.20	....	....	....
1	2.95	3.80	$4.25	....	....
1 1/8	3.55	4.55	5.05	....	....
1 1/4	4.50	5.75	6.40	$8.90	....
1 3/8	5.20	6.60	7.25	10.00	....
1 1/2	5.95	7.45	8.20	11.20	$14.20
1 5/8	7.25	9.00	9.90	13.40	16.90
1 3/4	8.40	10.40	11.40	15.40	19.40
1 7/8	9.85	12.10	13.25	17.75	22.25
2	11.75	14.40	15.75	21.00	26.30

Prices for 2 1/4 and 2 1/2 Inch Sizes on Application

SPRING COTTERS

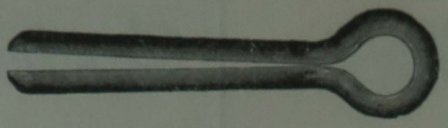


Fig. 1630

Made of half round spring wire; natural finish. Accurately headed and pointed

All measurements made under the eye

List in effect July 21, 1911

Wire Gauge, Nos.	Size, Inches	Quantity in Package	Wgt. per 1000, Lbs.	Per 1000
	1/16x 5/16	1,000	1/2	$3.50
	1/16x 3/8	1,000	3/4	3.50
	1/16x 7/16	1,000	3/4	3.50
	1/16x 1/2	1,000	3/4	3.50
	1/16x 5/8	1,000	1	4.15
	1/16x 3/4	1,000	1	4.15
	1/16x 7/8	1,000	1	4.80
	1/16x1	1,000	1	4.80
	1/16x1 1/8	1,000	1 1/4	5.45
	1/16x1 1/4	1,000	1 1/3	5.45
16	1/16x1 3/8	1,000	1 7/16	6.10
	1/16x1 1/2	1,000	1 1/2	6.10
	1/16x1 5/8	1,000	1 3/4	6.75
	1/16x1 3/4	1,000	2	6.75
	1/16x2	1,000	2 1/4	7.40
	1/16x2 1/4	1,000	2 1/2	8.05
	1/16x2 1/2	1,000	2 3/4	8.70
	1/16x2 3/4	500	3 1/4	9.35
	1/16x3	500	3 1/2	10.00
	1/16x3 1/4	500	3 3/4	10.65
	1/16x3 1/2	500	3 3/4	11.30
	5/64x 5/16	1,000	1	3.50
	5/64x 3/8	1,000	1	3.50
	5/64x 7/16	1,000	1	3.50
	5/64x 1/2	1,000	1	3.50
	5/64x 9/16	1,000	1 1/6	4.15
	5/64x 5/8	1,000	1 1/6	4.15
	5/64x 3/4	1,000	1 1/4	4.15
14 1/2	5/64x 7/8	1,000	1 1/2	4.80
	5/64x1	1,000	1 3/4	4.80
	5/64x1 1/4	1,000	2 1/6	5.45
	5/64x1 1/2	1,000	2 1/2	6.10
	5/64x1 3/4	1,000	2 7/8	6.75
	5/64x2	1,000	3 1/4	7.40
	5/64x2 1/4	1,000	3 1/2	8.05
	5/64x2 1/2	1,000	4	8.70
	5/64x3	1,000	4 1/2	10.00
	3/32x 1/2	1,000	1 1/2	3.50
	3/32x 5/8	1,000	1 5/8	4.15
	3/32x 3/4	1,000	2	4.15
	3/32x 7/8	1,000	2 1/8	4.80
13	3/32x1	1,000	2 1/4	4.80
	3/32x1 1/4	1,000	2 3/4	5.45
	3/32x1 1/2	1,000	3 1/2	6.10
	3/32x1 3/4	1,000	4	6.75
	3/32x2	1,000	4 1/2	7.40
	7/64x 1/2	1,000	2	4.00
	7/64x 3/4	1,000	2 3/4	4.75
	7/64x1	1,000	3 1/4	5.50
12	7/64x1 1/4	1,000	4	6.25
	7/64x1 1/2	1,000	4 3/4	7.00
	7/64x1 3/4	1,000	5	7.75
	7/64x2	1,000	6 1/8	8.50
	1/8x 1/2	1,000	2 3/4	5.00
	1/8x 3/4	1,000	3 1/2	5.85
	1/8x1	1,000	4	6.70
11	1/8x1 1/4	1,000	4 3/4	7.55
	1/8x1 1/2	1,000	5 1/2	8.40
	1/8x1 3/4	1,000	6	9.25
	1/8x2	1,000	7 1/4	10.10
	1/8x2 1/4	500	9	$10.95
11	1/8x2 1/2	500	9 3/4	11.80
	9/64x 3/4	1,000	4 1/2	7.00
	9/64x1	1,000	5 1/2	8.00
	9/64x1 1/4	1,000	6 1/4	9.00
10	9/64x1 1/2	1,000	6 3/4	10.00
	9/64x1 3/4	1,000	8 1/2	11.00
	9/64x2	500	10	12.00
	9/64x2 1/4	500	10 1/2	13.00
	9/64x2 1/2	500	12	14.00
	5/32x 1/2	1,000	4 1/4	7.00
	5/32x 3/4	1,000	5 1/2	8.15
	5/32x1	1,000	7	9.30
	5/32x1 1/4	1,000	8 1/4	10.45
9	5/32x1 1/2	1,000	9 1/4	11.60
	5/32x1 3/4	1,000	9 1/2	12.75
	5/32x2	500	10 3/4	13.90
	5/32x2 1/4	500	13 1/2	15.05
	5/32x2 1/2	500	14	16.20
	11/64x1	1,000	8	10.60
	11/64x1 1/4	1,000	9 1/8	11.90
	11/64x1 1/2	1,000	11	13.20
8	11/64x1 3/4	1,000	12 1/4	14.50
	11/64x2	500	14	15.80
	11/64x2 1/4	500	15 1/2	17.10
	11/64x2 1/2	500	16 1/2	18.40
	3/16x 3/4	1,000	8	11.10
	3/16x1	1,000	9 1/4	12.80
	3/16x1 1/4	1,000	10 1/2	14.50
	3/16x1 1/2	1,000	13 1/2	16.20
	3/16x1 3/4	500	14 1/4	17.90
7	3/16x2	500	16 1/2	19.60
	3/16x2 1/4	500	17 1/2	21.30
	3/16x2 1/2	500	20	23.00
	3/16x2 3/4	500	21 1/4	24.70
	3/16x3	250	22 3/4	26.40
	13/64x1	1,000	12	14.00
	13/64x1 1/4	1,000	12 3/4	16.00
	13/64x1 1/2	1,000	15 1/2	18.00
	13/64x1 3/4	500	20	20.00
6	13/64x2	500	20 1/2	22.00
	13/64x2 1/4	500	22 3/4	24.00
	13/64x2 1/2	500	24 3/4	26.00
	13/64x2 3/4	250	26 3/4	28.00
	13/64x3	250	28 3/4	30.00
	7/32x1	500	15 1/2	18.00
	7/32x1 1/4	500	17 3/4	20.80
	7/32x1 1/2	500	20 1/4	23.60
	7/32x1 3/4	500	20 3/4	26.40
5	7/32x2	250	25 1/4	29.20
	7/32x2 1/4	250	27 1/2	32.00
	7/32x2 1/2	250	30	34.80
	7/32x2 3/4	250	32 1/2	37.60
	7/32x3	250	35	40.40
	1/4x1	500	18	20.00
	1/4x1 1/4	500	20 1/2	23.50
4	1/4x1 1/2	500	23	27.00
	1/4x1 3/4	500	26 1/2	30.50
	1/4x2	250	29	34.00
	1/4x2 1/4	250	32 1/2	37.50
	1/4x2 1/2	250	35	$41.00
	1/4x2 3/4	250	36	44.50
	1/4x3	250	40	48.00
4	1/4x3 1/4	250	43	51.50
	1/4x3 1/2	250	46	55.00
	1/4x3 3/4	250	48	58.50
	1/4x4	150	51	62.00
	5/16x1	500	29 1/2	32.50
	5/16x1 1/4	250	34	37.50
	5/16x1 1/2	250	38	42.50
	5/16x1 3/4	250	44	47.50
	5/16x2	250	47 1/4	52.50
	5/16x2 1/4	250	52 1/4	57.50
1	5/16x2 1/2	250	57 1/2	62.50
	5/16x2 3/4	250	61 1/2	67.50
	5/16x3	200	67	72.50
	5/16x3 1/4	200	70 1/2	77.50
	5/16x3 1/2	150	75 1/4	82.50
	5/16x3 3/4	150	79 3/4	87.50
	5/16x4	100	84 1/2	92.50
	3/8x1 1/2		60	72.00
	3/8x1 3/4		66	79.20
	3/8x2		70	86.40
	3/8x2 1/4		78	93.60
	3/8x2 1/2		84	100.80
	3/8x2 3/4		91	108.00
	3/8x3		95	115.20
	3/8x3 1/4		103	122.40
	3/8x3 1/2		109	129.60
	3/8x3 3/4		116	136.80
	3/8x4		123	144.00
	7/16x1 3/4		108	108.00
	7/16x2		118	119.50
	7/16x2 1/4		128	131.00
	7/16x2 1/2		138	142.50
	7/16x2 3/4		148	154.00
	7/16x3		159	165.50
	7/16x3 1/4		169	177.00
	7/16x3 1/2		180	188.50
	7/16x3 3/4		189	200.00
	7/16x4		198	211.50
	7/16x5		239	257.50
	1/2x2		150	148.50
	1/2x2 1/4		161	163.50
	1/2x2 1/2		175	178.50
	1/2x2 3/4		189	193.50
	1/2x3		200	208.50
	1/2x3 1/4		213	223.50
	1/2x3 1/2		225	238.50
	1/2x3 3/4		238	253.50
	1/2x4		250	268.50
	1/2x5		300	328.50
	1/2x6		350	388.50
	5/8x3		300	384.00
	5/8x3 1/4		349	404.00
	5/8x3 1/2		369	424.00
	5/8x3 3/4		388	444.00
	5/8x4		455	464.00
	5/8x5		487	544.00
	5/8x6		566	644.00

Sizes 3/8x1 1/2 inches and larger are packed in Bulk

List and discount apply to Standard packages only. When ordered in packages other than regular, subject to extra charge for packing and boxes at cost. List on Brass Cotters eight times the list of steel.

ROUND DRILL RODS

For punches, taps, reamers, twist drills or other small tools that require a high-grade polished crucible cast tool steel.

Size* Inches	Decimal Equavalents, Inches	Per Lb.	Size* Inches	Decimal Equivalents, Inches	Per Lb.	Size* Inches	Decimal Equivalents, Inches	Per Lb.	Size* Inches	Decimal Equivalents, Inches	Per Lb.
1 1/4	1.250	$0.50	33/64	0.5156	$0.55	7/32	0.2187	$0.75	3/32	0.0937	$1.05
1 13/64	1.2343	.50	1/2	0.500	.60	3	0.212	.75	42	0.092	1.05
1 7/32	1.2187	.50	31/64	0.4843	.60	4	0.207	.75	43	0.088	1.05
1 13/64	1.203	.50	15/32	0.4687	.60	5	0.204	.75	44	0.085	1.05
1 3/16	1.1875	.50	29/64	0.4531	.60	13/64	0.2031	.75	45	0.081	1.05
1 11/64	1.1718	.50	7/16	0.4375	.60	6	0.201	.75	46	0.079	1.05
1 5/32	1.1562	.50	27/64	0.4218	.75	7	0.199	.75	5/64	0.0781	1.05
1 9/64	1.1406	.50	Z	0.413	.75	8	0.197	.75	47	0.077	1.20
1 1/8	1.125	.50	13/32	0.4062	.75	9	0.194	.75	48	0.075	1.20
1 7/64	1.1093	.50	Y	0.404	.75	10	0.191	.75	49	0.072	1.20
1 3/32	1.0937	.50	X	0.397	.75	11	0.188	.75	50	0.069	1.20
1 5/64	1.0781	.50	25/64	0.3906	.75	3/16	0.1875	.75	51	0.066	1.45
1 1/16	1.0625	.50	W	0.386	.75	12	0.185	.75	52	0.063	1.45
1 3/64	1.0468	.50	V	0.377	.75	13	0.182	.75	1/16	0.0625	1.45
1 1/32	1.0312	.50	3/8	0.375	.75	14	0.180	.75	53	0.058	1.45
1 1/64	1.0156	.50	U	0.368	.75	15	0.178	.75	54	0.055	1.45
1	1.000	.50	23/64	0.3593	.75	16	0.175	.83	55	0.050	1.80
63/64	0.9843	.50	T	0.358	.75	17	0.172	.83	3/64	0.0468	1.80
31/32	0.9687	.50	S	0.348	.75	11/64	0.1718	.83	56	0.045	1.80
61/64	0.953	.50	11/32	0.3437	.75	18	0.168	.83	57	0.042	1.80
15/16	0.9375	.50	R	0.339	.75	19	0.164	.83	58	0.041	2.10
59/64	0.9218	.50	Q	0.332	.75	20	0.161	.83	59	0.040	2.10
29/32	0.9062	.50	21/64	0.3281	.75	21	0.157	.83	60	0.039	2.10
57/64	0.8906	.50	P	0.323	.75	5/32	0.1562	.83	61	0.038	2.40
7/8	0.875	.50	O	0.316	.75	22	0.155	.83	62	0.037	2.40
55/64	0.8593	.50	5/16	0.3125	.75	23	0.153	.83	63	0.036	2.70
27/32	0.8437	.50	N	0.302	.75	24	0.151	.83	64	0.035	2.70
53/64	0.828	.50	19/64	0.2968	.75	25	0.148	.83	65	0.033	2.70
13/16	0.8125	.50	M	0.295	.75	26	0.146	.83	66	0.032	3.00
51/64	0.7968	.50	L	0.290	.75	27	0.143	.83	1/32	0.0312	3.00
25/32	0.7812	.50	9/32	0.2812	.75	9/64	0.1406	.83	67	0.031	3.00
49/64	0.7656	.50	K	0.281	.75	28	0.139	.83	68	0.030	3.00
3/4	0.750	.55	J	0.277	.75	29	0.134	.83	69	0.029	3.30
47/64	0.7343	.55	I	0.272	.75	30	0.127	.83	70	0.027	3.30
23/32	0.7187	.55	H	0.266	.75	1/8	0.125	.83	71	0.026	3.60
45/64	0.703	.55	17/64	0.2656	.75	31	0.120	.90	72	0.024	3.60
11/16	0.6875	.55	G	0.261	.75	32	0.115	.90	73	0.023	3.60
43/64	0.6718	.55	F	0.257	.75	33	0.112	.90	74	0.022	3.90
21/32	0.6562	.55	E	0.250	.75	34	0.110	.90	75	0.020	4.05
41/64	0.6406	.55	1/4	0.250	.75	7/64	0.1093	.90	76	0.018	4.20
5/8	0.625	.55	D	0.246	.75	35	0.108	.90	77	0.016	4.50
39/64	0.6093	.55	C	0.242	.75	36	0.106	.90	1/64	0.0156	4.50
19/32	0.5937	.55	B	0.238	.75	37	0.103	.90	78	0.015	4.80
37/64	0.578	.55	15/64	0.2343	.75	38	0.101	.90	79	0.014	5.10
9/16	0.5625	.55	A	0.234	.75	39	0.099	1.05	80	0.013	5.40
35/64	0.5468	.55	1	0.227	.75	40	0.097	1.05			
17/32	0.5312	.55	2	0.219	.75	41	0.095	1.05			

*Letter and number sizes refer to Letter Size Drills and Wire Gauge Drills.

Prices of high-speed steel on application.

SQUARE DRILL RODS

Size, Inches	Decimal Equivalents, Inches	Per Lb.	Size, Inches	Decimal Equivalents, Inches	Per Lb.	Size, Inches	Decimal Equivalents, Inches	Per Lb.	Size, Inches	Decimal Equivalents, Inches	Per Lb.
1/2	0.500	$1.60	3/8	0.375	$1.60	1/4	0.250	$1.60	1/8	0.125	$1.60
15/32	0.4687	1.60	11/32	0.344	1.60	7/32	0.219	1.60	3/32	0.094	1.60
7/16	0.4375	1.60	5/16	0.3125	1.60	3/16	0.1875	1.60	1/16	0.0625	1.60
13/32	0.4062	1.60	9/32	0.281	1.60	5/32	0.156	1.60			

Prices of high-speed steel on application.

TAPER PINS

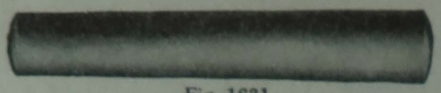


Fig. 1631

Best refined steel, perfectly machined; bright finish; taper ¼ inch to the foot.

Per Hundred

NOS.	00	0	1	2	3	4
Diameter Large End, Inches	.136	.156	.172	.193	.219	.250
Fractional Sizes	9/64	5/32	11/64	3/16	7/32	1/4
Length, Inches						
½	$1.80	$1.80	$2.00	.....	.....	.....
¾	1.80	1.80	2.00	$2.10	$2.30	$2.50
1	2.05	2.05	2.25	2.35	2.55	2.75
1¼	2.30	2.30	2.50	2.60	2.80	3.00
1½	2.55	2.55	2.75	2.85	3.05	3.25
1¾	2.80	2.80	3.00	3.10	3.30	3.50
2	3.05	3.05	3.25	3.35	3.55	3.75
2¼	3.30	3.30	3.50	3.60	3.80	4.00
2½	3.55	3.55	3.75	3.85	4.05	4.25
2¾	.....	3.80	4.00	4.10	4.30	4.50
3	.....	4.05	4.25	4.35	4.55	4.75
3¼	.....	.....	.....	4.60	4.80	5.00
3½	.....	.....	.....	4.85	5.05	5.25
3¾	.....	.....	.....	.....	.....	5.50
4	.....	.....	.....	.....	.....	5.75

Per Hundred

NOS.	5	6	7	8	9	10
Diameter Large End, Inches	.289	.341	.409	.492	.591	.706
Fractional Sizes	19/64	11/32	13/32	½	19/32	23/32
Length, Inches						
¾	$2.75	$3.00	.....	.....	.....	.....
1	3.00	3.25	$3.75	.....	.....	.....
1¼	3.25	3.50	4.00	$4.65	.....	.....
1½	3.50	3.75	4.25	5.00	$7.00	$9.00
1¾	3.75	4.00	4.50	5.40	7.50	9.50
2	4.05	4.35	4.75	5.80	8.00	10.00
2¼	4.40	4.75	5.25	6.25	8.60	10.75
2½	4.75	5.20	5.75	6.75	9.20	11.50
2¾	5.10	5.70	6.25	7.25	9.80	12.25
3	5.45	6.25	6.75	7.80	10.50	13.25
3¼	5.80	6.75	7.25	8.40	11.20	14.25
3½	6.15	7.25	7.75	9.00	11.90	15.25
3¾	6.50	7.75	8.25	9.60	12.60	16.25
4	6.85	8.25	8.75	10.20	13.30	17.25
4¼	.....	8.75	9.25	10.80	14.00	18.25
4½	.....	9.25	9.75	11.40	14.70	19.25
4¾	.....	9.75	10.25	12.00	15.40	20.25
5	.....	10.25	10.75	12.60	16.10	21.25
5¼	.....	.....	.....	.....	16.80	22.25
5½	.....	.....	.....	.....	17.50	23.25
5¾	.....	.....	.....	.....	18.20	24.25
6	.....	.....	.....	.....	18.90	25.25

Note.—If ordering sizes other than those included in the above list, furnish the length and the size at the larger end.

Fig 1632

MUSIC WIRE

Cast steel for mechanical purposes and is extremely tough, instead of being brittle.

List Prices Effective June 29, 1916

NOS.	Dia., In.	Feet, Per Lb.	Per Lb.	NOS.	Dia., In.	Feet, Per Lb.	Per Lb.
0000000	.003	39000	.....	23	.051	144	$1.20
000000	.004	23433	.....	24	.055	124	1.20
00000	.005	14997	.....	25	.059	108	1.20
0000	.006	10415	.....	26	.063	94	1.20
000	.007	7652	.....	27	.067	83	1.20
00	.008	5858	$12.00	28	.071	74	1.20
0	.009	4629	9.00	29	.075	68	1.20
1	.010	3749	7.50	30	.080	58	1.20
2	.011	2936	6.00	31	.083	54	1.20
3	.012	2604	5.00	32	.086	51	1.20
4	.013	2218	4.00	33	.091	46	1.20
5	.014	1913	3.50	34	.094	43	1.20
6	.016	1465	3.00	35	.098	39	1.20
7	.018	1157	2.75	36	.102	36	1.20
8	.020	937	2.50	37	.106	34	1.20
9	.022	775	2.25	38	.111	32	1.20
10	.024	651	2.00	39	.114	29	1.20
11	.026	560	1.80	40	.118	27	1.20
12	.029	447	1.80	1/8 in.	.125	24	1.20
13	.031	391	1.60	9/16 in.	.140	20	1.20
14	.033	344	1.60	5/32 in.	.156	16	1.20
15	.035	305	1.60	11/64 in.	.172	12	1.20
16	.037	274	1.40	3/16 in.	.187	10	1.20
17	.039	247	1.40	7/32 in.	.218	8	1.20
18	.041	223	1.40	1/4 in.	.250	5½	1.20
19	.043	203	1.20	9/32 in.	.281	4¾	1.20
20	.045	185	1.20	5/16 in.	.3125	4	1.20
21	.047	170	1.20	3/8 in.	.375	2⅔	1.20
22	.049	156	1.20				

Prices of sizes omitted on application.
No. 7/0, 6/0, 5/0, 4/0, 3/0, on ¼ lb. spools
No. 2/0 to 36 inclusive—in ¼ lb. coils.
No. 2/0 to ⅛ inch inclusive—in 1 lb. coils.
No. 10 to 3/16 inch inclusive—in 5 lb. coils.
3/16 inch and larger—in 10 lb. coils.

COPPERED BESSEMER RODS

Furnished in 6-foot lengths.

Size, Inches	Decimal Equiv., Inches	Size, Inches	Decimal Equiv., Inches	Size, Inches	Decimal Equiv., Inches
13/16	.812	27/64	.422	No. 7	.180
25/32	.781	13/32	.406	11/64	.172
3/4	.750	25/64	.391	No. 8	.165
23/32	.719	3/8	.375	5/32	.156
11/16	.688	23/64	.359	No. 9	.148
21/32	.656	11/32	.344	9/64	.141
5/8	.625	21/64	.328	No. 10	.134
19/32	.594	5/16	.312	1/8	.125
9/16	.562	19/64	.297	No. 11	.120
35/64	.547	9/32	.281	7/64	.109
17/32	.531	17/64	.266	3/32	.094
33/64	.516	1/4	.250	....	.084
1/2	.500	15/64	.234	5/64	.078
31/64	.484	7/32	.219	1/16	.062
15/32	.469	13/64	.203	....	.508
29/64	.453	....	.197	....	.049
7/16	.437	3/16	.187	....	.042

	Per Pound		Per Pound
13/16 to 33/64 Inch	$.....	7/64 to .058 Inch	$.....
1/2 to 5/32 Inch Base	.....	.049 to .042 Inch	.....
No. 9 to No. 11	.....		

STEEL WIRE

American Steel and Wire Co.'s Steel Wire Gauge.

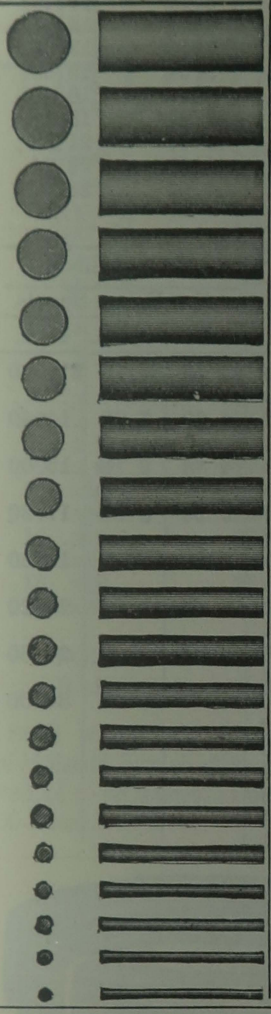
FULL SIZE	Steel Wire Gauge No.	Sizes of Wire: Common Fractions	Sizes of Wire: Decimally	Weight One Mile, Lbs.	Lbs. per Foot	Feet to Pound
	1		.2830	1128.0	.2136	4.681
		9/32	.28125	1114.0	.211	5.441
	2		.2625	970.4	.1838	
		1/4	.250	880.2	.1667	
	3		.2437	836.4	.1584	6.313
	4		.2253	714.8	.1354	7.386
		7/32	.21875	673.9	.1276	
	5		.2070	603.4	.1143	8.750
	6		.1920	519.2	.0983	10.17
		3/16	.1875	495.1	.0937	
	7		.1770	441.2	.0835	11.97
	8		.1620	369.6	.070	14.29
		5/32	.15625	343.8	.0651	
	9		.1483	309.7	.0586	17.05
	10		.1350	256.7	.0486	20.57
		1/8	.1250	220.0	.0416	
	11		.1205	204.5	.0387	25.82
	12		.1055	156.7	.0296	33.69
		3/32	.09375	123.8	.0234	
	13		.0915	117.9	.0223	44.78
	14		.0800	90.13	.0170	58.58
	15		.0720	73.01	.0138	72.32
	16	1/16	.0625	55.0	.0104	95.98
	17		.0540	41.07	.0077	128.6
	18		.0475	31.77	.006	166.2
	19		.0410	23.67	.0044	223.0
	20		.0348	17.05	.0032	309.6

Fig. 1633

Decimal Equivalents	
1/64 = .0156	33/64 = .5156
1/32 = .0312	17/32 = .5312
3/64 = .0468	35/64 = .5468
1/16 = .0625	9/16 = .5625
5/64 = .0781	37/64 = .5781
3/32 = .0937	19/32 = .5937
7/64 = .1093	39/64 = .6093
1/8 = .125	5/8 = .625
9/64 = .1406	41/64 = .6406
5/32 = .1562	21/32 = .6562
11/64 = .1718	43/64 = .6718
3/16 = .1875	11/16 = .6875
13/64 = .2031	45/64 = .7031
7/32 = .2187	23/32 = .7187
15/64 = .2343	47/64 = .7343
1/4 = .25	3/4 = .75
17/64 = .2656	49/64 = .7656
9/32 = .2812	25/32 = .7812
19/64 = .2968	51/64 = .7968
5/16 = .3125	13/16 = .8125
21/64 = .3281	53/64 = .8281
11/32 = .3437	27/32 = .8437
23/64 = .3593	55/64 = .8593
3/8 = .375	7/8 = .875
25/64 = .3906	57/64 = .8906
13/32 = .4062	29/32 = .9062
27/64 = .4218	59/64 = .9218
7/16 = .4375	15/16 = .9375
29/64 = .4531	61/64 = .9531
15/32 = .4687	31/32 = .9687
31/64 = .4843	63/64 = .9843
1/2 = .5	1 = 1.0

CAST STEEL WIRE

NOS	1/2 to 6	7 to 9	10 and 11	12	13	14	15	16	17
Per Pound	$0.23	.24	.25	.26	.28	.30	.32	.33	.34
NOS	18	19	20	21	22	23	24	25	26
Per Pound	$0.36	.38	.40	.50	.60	.75	1.00	1.25	1.50

NEEDLE STEEL WIRE

NOS	12 to 14	15 and 16	17	18	19	20	21	22	23	24	25
Per Pound	$0.55	.60	.65	.70	.75	.80	.85	.90	1.00	1.10	1.20

ADVANCES OVER BASE PER 100 POUNDS

PLAIN FENCE WIRE

NOS	9 to 1/2-inch, inclusive	10	11	12	12 1/2	13	14	15	16	17	18
Annealed	Base	$0.05	.10	.15	.15	.25	.35	.45	.55	.70	.85
Galvanized, Additional	$0.70	.70	.70	.70	.70	.70	.70	1.05	1.05	1.45	1.45

MARKET WIRE

NOS	9	10	11	12	13	14	15	16	17	18
Bright	Base	$0.05	.10	.15	.25	.35	.45	.55	.70	.85
Tinned	$1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.50	1.50

STONE WIRE

NOS	16	17	18	19	20	21	22	23	24	25	26
Regular	Base	$0.15	.30	.70	.85	1.00	1.15	1.30	1.45	1.60	1.75
Tinned	$2.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
NOS	27	28	29	30	31	32	33	34	35	36	....
Regular	$2.50	2.70	2.90	3.10	3.30	3.50	4.00	4.60	5.60	7.60	....
Tinned	$3.50	3.50	3.50	3.50	3.50	4.50	4.50	4.50	6.00	6.00	....

SPOOLED WIRE

The handling of small wire on spools is an economical and most satisfactory way. It is wound closely on spools, and has a thin coating of shellac to prevent corrosion.

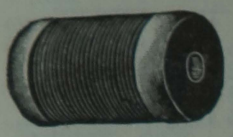


Fig. 1634

Gauge No.	Per Dozen Spools, Soft Brass			Gauge No.	Per Dozen Spools, Soft Brass		
	¼ Lb.	½ Lb.	1 Lb.		¼ Lb.	½ Lb.	1 Lb.
16	$2.20	$3.90	$7.50	27	$3.12	$5.52	$10.34
17	2.20	3.90	7.50	28	3.46	6.12	11.48
18	2.20	3.90	7.50	29	3.62	6.48	12.14
19	2.20	3.90	7.50	30	4.20	7.44	13.94
20	2.20	3.90	7.50	31	4.52	8.04	15.08
21	2.30	4.20	8.00	32	4.92	8.76	16.40
22	2.40	4.40	8.20	33	5.52	9.84	18.44
23	2.50	4.60	8.50	34	6.42	11.40	21.38
24	2.60	4.70	8.60	35	8.76	15.60	29.24
25	2.70	4.80	9.00	36	10.10	18.00	33.76
26	2.70	4.90	9.20	..	....	....	.....

Gauge No.	Annealed Steel, Per Dozen Spools			Annealed Tinned, Per Dozen Spools			Spring Brass, Per Dozen Spools			Soft Copper, Per Dozen Spools			Nickel Silver, Per Dozen Spools		
	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.
16	$0.96	$1.58	$2.46	$1.20	$2.08	$3.50	$2.20	$3.90	$7.50	$2.20	$3.90	$7.50	$4.15	$7.70	$14.20
17	.96	1.60	2.56	1.20	2.11	3.58	2.20	3.90	7.50	2.20	3.90	7.50	....	....	.....
18	.96	1.64	2.64	1.20	2.13	3.64	2.20	3.90	7.50	2.20	3.90	7.50	4.20	7.80	14.40
19	1.02	1.66	2.68	1.25	2.18	3.70	2.20	3.90	7.50	2.20	3.90	7.50	....	....	.....
20	1.02	1.68	2.76	1.25	2.18	3.75	2.20	3.90	7.50	2.20	3.90	7.50	4.35	8.10	15.00
21	1.08	1.74	2.86	1.28	2.30	3.90	2.30	4.20	8.00	2.30	4.20	8.00	....	....	.....
22	1.10	1.80	2.96	1.32	2.36	4.00	2.40	4.40	8.20	2.40	4.40	8.20	5.20	9.90	17.80
23	1.12	1.86	3.05	1.36	2.42	4.10	2.50	4.60	8.50	2.50	4.60	8.50	.....	....	.....
24	1.14	1.94	3.15	1.40	2.48	4.20	2.60	4.70	8.60	2.60	4.70	8.60	5.55	10.40	19.20
25	1.18	2.00	3.20	1.45	2.55	4.40	2.70	4.80	9.00	2.70	4.80	9.00	....	....	.....
26	1.20	2.04	3.30	1.50	2.60	4.50	2.70	4.90	9.20	2.70	4.90	9.20	5.80	10.80	20.20
27	1.20	2.06	3.53	1.58	2.77	4.75	3.12	5.52	10.34	3.12	5.52	10.34	....	....	.....
28	1.22	2.13	3.65	1.65	2.89	4.95	3.46	6.12	11.48	3.46	6.12	11.48	7.05	13.60	24.60
29	1.26	2.21	3.78	1.72	3.00	5.15	3.62	6.48	12.14	3.62	6.48	12.14	....	....	.....
30	1.34	2.35	4.03	1.78	3.11	5.35	4.20	7.44	13.94	4.20	7.44	13.94	8.40	15.90	30.00
31	1.39	2.43	4.16	1.85	3.23	5.54	4.52	8.04	15.08	4.52	8.04	15.08	....	....	.....
32	1.47	2.57	4.41	2.11	3.70	6.34	4.92	8.76	16.40	4.92	8.76	16.40	....	....	.....
33	1.55	2.72	4.66	2.17	3.81	6.53	5.52	9.84	18.44	5.52	9.84	18.44	....	....	.....
34	1.68	2.94	5.04	2.24	3.93	6.73	6.32	11.40	21.38	6.42	11.40	21.38	....	....	.....
35	1.89	3.31	5.67	2.64	4.62	7.92	8.76	15.60	29.24	8.76	15.60	29.24	....	....	.....
36	2.20	3.94	6.73	3.17	5.54	9.50	10.10	18.00	33.76	10.10	18.00	33.76	.....	.....	.....

BRASS AND COPPER WIRE

IN COILS

Brown and Sharpe Gauge the Standard

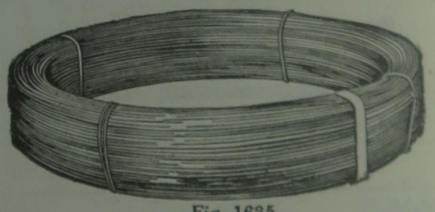


Fig. 1635

EXTRA OVER BASE PRICES, PER POUND

	NO. 8-.1285 and Larger	NOS. 9-.1144 10-.1019 11-.0907	NOS. 12-.0808 13-.0719 14-.0640	NOS. 15-.0452 16-.0403	NOS. 17-.0452 18-.0403	NOS. 19-.0358 20-.0319	NOS. 21-.0284 22-.0253	NOS. 23-.0225	NOS. 24-.0201
Round	Base	$0.01	.02	.03	.03½	.04½	.05½	.06	.06½
Hex. Oct. and Square	0.02	.03	.05	.06	.07½	.08½	.09½	.10	.10½
Flat and Half Round	$0.04	.05	.06	.07	.07½	.08½	.09½	.10	.10½

Prices are for 100 Pounds or More of Wire in Coils in One Order.

ADVANCES

Spring wire, 2 cents per pound. Whitened wire, 3 cents per pound. Flat, square, and half-round wire, 4 cents advance per pound on round wire, gauged the thin way after finishing.

Fancy wire not less than 10 cents advance per pound on round wire.

Wire straightened and cut, No. 12 and smaller, 12 cents per pound; same additions for cutting to length, when under 2 feet, as rods.

All wire between gauges takes price of next smaller gauge.

Wire in coils, 3 pounds and under, the same extras as spooling wire of corresponding weights.

On Spools, Lbs.	1	2	3	4	5	10	15	20	25
Per Pound	$0.12	.11	.10	.09	.06	.04	.02	.02	.02

Less than one-pound spools, $0.24 per pound.

WIRE CLOTH

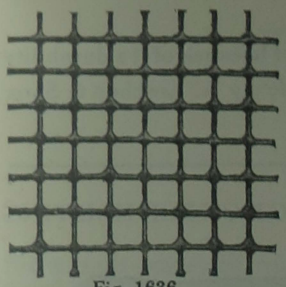


Fig. 1636

HARDWARE GRADE GALVANIZED

Steel wire cloth, heavily galvanized after weaving. Full rolls 100 lineal feet each.

Widths, 24 to 48 inches.

Mesh Per Inch	No. Wire	Weight 100 Sq. Feet, Lbs.	Per Sq. Foot
¾x ¾	16	39	$0.08
⅝x ⅝	17	37.7	.08
2 x 2	18	39.7	.08
2½x 2½	19	35	.08
3 x 3	20	35	.08
3½x 3½	21	32.5	.08
4 x 4	22	32	.08
5 x 5	23	33	.08
6 x 6	24	31	.08
7 x 7	25	31.6	.08
8 x 8	26	27	.08
9 x 9	27	26.2	.08
10 x10	28	25.8	.08
12 x12	29	23	.08
14 x14	33	22.5	.08
16 x16	34	21	.09
18 x18	35	20.4	.09
20 x20	36	20	.09

FOUNDRY AND GRAIN CLEANING

Steel wire cloth, black and galvanized; furnished in widths from 24 to 48 inches. Full rolls, 100 lineal feet each.

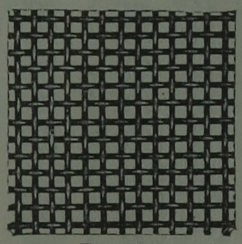


Fig. 1637

Mesh Per Inch	Foundry No. Wire	Foundry Wgt. Per 100 Sq. Feet, Lbs.	Foundry Per Sq. Foot	Grain No. Wire	Grain Wgt. Per 100 Sq. Feet, Lbs.	Grain Per Sq. Foot
1 x 1	11	102	$0.17	14	91	$0.10
¾x ¾	12	103	.17	15	86	.10
⅝x ⅝	13	98.8	.17	16	75	.10
2 x 2	14	93	.17	17	73	.10
2½x 2½	15	98	.17	18	62	.10
3 x 3	16	90	.17	19	60	.10
3½x 3½	17	73	.17	20	53.2	.10
4 x 4	18	72	.17	21	52	.10
4½x 4½	19	68	.17	21	51	.11
5 x 5	20	61	.17	22	48.3	.10
6 x 6	21	53	.17	23	45.3	.10
7 x 7	22	57	.17	24	40	.10
8 x 8	23	48.3	.17	25	41	.10
9 x 9	24	45.3	.17	26	39.4	.10
10 x10	25	41	.17	27	37	.10
12 x12	26	39.4	.17	28	34	.10
14 x14	27	37	.17	31	33	.10
16 x16	28	36	.17	32	30	.11
18 x18	29	34	.17	33	28	.11
20 x20	31	33	.17	34	25	.12

BRASS STRAINER CLOTH IN 5-FOOT ROLLS—12 INCHES WIDE

NO. Mesh	40	50	60
Per Square Foot	$0.24	.30	.50

WIRE CLOTH

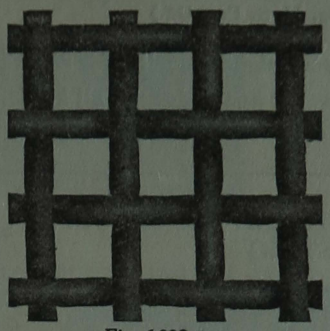


Fig. 1638

LOCOMOTIVE STACK NETTING

All double crimped. By crimping both wires evenly, the wires are locked and cannot be forced out of their proper positions.

Mesh Per Inch	Diam. Wire, Inches	Per Square Foot	Mesh Per Inch	Diam. Wire, Inches	Per Square Foot
2	.162	$0.60	3	.105	$0.40
2	.148	.50	3	.098	.38
2	.135	.42	3	.092	.35
2	.128	.39	3½	.135	.75
2	.120	.35	3½	.128	.70
2	.105	.30	3½	.120	.65
2½	.162	.72	3½	.110	.55
2½	.148	.60	3½	.105	.50
2½	.135	.50	3½	.098	.45
2½	.128	.46	3½	.092	.40
2½	.120	.42	4	.120	.80
2½	.110	.38	4	.110	.68
2½	.105	.35	4	.105	.60
2½	.098	.33	4	.098	.54
2½	.092	.28	4	.092	.48
3	.148	.75	4	.080	.38
3	.135	.60	5	.092	.60
3	.128	.55	5	.080	.48
3	.120	.50	5	.072	.40
3	.110	....	....	....	....

COAL AND GRAVEL

For grading coal, coke, stone, gravel or sand. Space denotes actual opening between the wires.

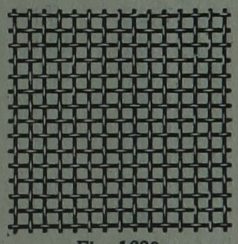


Fig. 1639

Space, Inches	Size Wire, Inches	No. Wire	Per Sq. Foot
2½	⅜	000	$0.75
2½	11/32	00	.65
2½	5/16	0	.55
2¼	11/32	00	.67
2¼	5/16	0	.58
2¼	¼	3	.44
2	5/16	0	.67
2	9/32	1	.64
2	¼	3	.55
1¾	5/16	0	.72
1¾	9/32	1	.67
1¾	17/64	2	.64
1¾	¼	3	.58
1½	9/32	1	.71
1½	17/64	2	.67
1½	¼	3	.61
1¼	17/64	2	.68
1¼	¼	3	.65
1¼	.....	4	.54
1¼	.....	5	.45
1	¼	3	.73
1	.....	4	.58
1	.....	5	.48
⅞	.....	4	.66
⅞	.....	5	.55
⅞	.....	6	.45

"HERCULES" (RED-STRAND) WIRE ROPE

(Reg. U. S. Pat. Off.)

This is a wire rope of the very highest quality for severe work. It is not only a safe rope, but because of it s durability it is the most economical rope for heavy duty of all kinds. Hercules wire rope is made only by A. Leschen & Sons Rope Co.

PATENT FLATTENED STRAND CONSTRUCTION FOR HOISTING

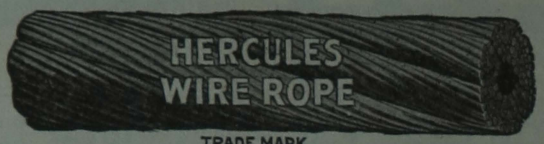


Fig. 1640

6 Strands of 25 Wires Each, 1 Hemp Core

Diam. in Inches	List Price, Per Foot	Approx. Breaking Strength in Tons of 2000 Lbs.	Usual Working Load in Tons of 2000 Lbs.	Approx. Weight, Per Foot	Diam. of Drum or Sheave in Feet Advised
3/8	$0.18 1/4	7.4	1.5	.25	2
1/2	.20 3/4	13.3	2.7	.45	2.75
9/16	.25	16	3.2	.58	3
5/8	.28	21	4.2	.72	3.50
3/4	.37 1/2	29	5.8	1.00	4
7/8	.49	39	7.8	1.38	4.50
1	.60	50	10.0	1.80	5
1 1/8	.71	62	12.4	2.30	6
1 1/4	.89	76	15.2	2.80	7
1 3/8	1.12	92	18.4	3.45	7.50
1 1/2	1.37	108	21.6	4.00	8
1 5/8	1.56	121	24.2	4.75	8.50
1 3/4	2.08	146	29.2	5.60	9
2	2.25	183	36.6	7.25	11
2 1/4	2.85	231	46.2	9.20	12
2 1/2	3.50	289	58	11.2	14
2 5/8	3.90	317	63.5	12.5	15
2 3/4	4.30	345	69	13.8	16

PATENT FLATTENED STRAND CONSTRUCTION FOR HAULAGE

6 Strands of 8 Wires Each, 1 Hemp Core

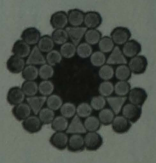


Fig. 1641

3/8	$0.13 1/4	7.0	1.40	.25	2.75
1/2	.16 1/4	11.9	2.38	.45	3.75
5/8	.25	19	3.8	.72	4.50
3/4	.35	27	5.4	1.00	5.25
7/8	.44	36	7.2	1.38	6
1	.58	46	9.2	1.80	6.75
1 1/8	.70	56	11.2	2.30	8
1 1/4	.88	73	14.6	2.80	9.25
1 3/8	1.08	85	17	3.45	10
1 1/2	1.28	96	19	4.00	11

ROUND STRAND CONSTRUCTION FOR HOISTING

Fig. 1642

6 Strands of 19 Wires Each, 1 Hemp Core

Diam. in Inches	List Price, Per Foot	Approx. Breaking Strength in Tons of 2000 Lbs.	Usual Working Load in Tons of 2000 Lbs.	Approx. Weight per Foot	Diam. of Drum or Sheave in Feet Advised
1/4	$0.13	3.15	.63	.10	1
5/16	.13 1/2	4.50	.9	.15	1.25
3/8	.14 1/2	6.75	1.35	.22	1.50
7/16	.15 1/2	9.4	1.9	.30	1.75
1/2	.17	12.1	2.4	.39	2
9/16	.19	14.5	2.9	.50	2.25
5/8	.22 1/2	19	3.8	.62	2.50
3/4	.31	26.3	5.3	.89	3
7/8	.39	35	7	1.20	3.50
1	.50	45	9	1.58	4
1 1/8	.62	56	11	2	4.50
1 1/4	.75	69	14	2.45	5
1 3/8	.90	84	17	3	5.50
1 1/2	1.10	98	20	3.55	6
1 5/8	1.30	110	22	4.15	6.50
1 3/4	1.60	133	27	4.85	7
1 7/8	1.75	150	30	5.55	8
2	1.85	166	33	6.30	8
2 1/4	2.50	210	42	8	9
2 1/2	2.80	263	53	9.85	10
2 3/4	3.45	315	63	11.95	11

ROUND STRAND CONSTRUCTION FOR HAULAGE

6 Strands of 7 Wires Each, 1 Hemp Core

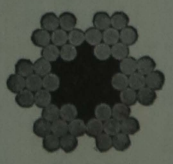


Fig. 1643

3/8	$0.08 3/4	6.50	1.3	.22	2.50
7/16	.11 1/2	7.75	1.5	.30	3
1/2	.13 1/2	11	2.2	.39	3.50
9/16	.17	13	2.6	.50	4
5/8	.20 1/2	17.50	3.5	.62	4.50
11/16	.24 1/2	20	4	.75	4.75
3/4	.28 1/2	25	5	.89	5
7/8	.37	33	6.6	1.20	6
1	.48	42	8.4	1.58	7
1 1/8	.58	52	10	2	8
1 1/4	.72	67	13	2.45	9
1 3/8	.88	79	16	3	10
1 1/2	1.05	90	18	3.55	11

HOISTING ROPE

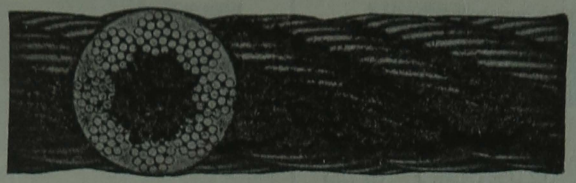


Fig. 1644

Six strands—nineteen wires to the strand—one hemp core; largely used for heavy mine hoisting, derricks, inclined planes, dredges, cableways for heavy logging, scraper lines, wrecking lines, ballast unloader ropes, heavy cranes, and similar uses. In deep mine shafts and long inclines it is especially efficient, because it possesses great strength for its weight. Extra strong crucible cast steel rope is made from selected steel wires of higher tensile strength than the crucible cast steel wire and possesses greater strength; particularly useful for oil well drilling and tubing lines.

STANDARD IRON

Dia., Inches	Circumference, Inches	Weight Per Foot, Lbs.	Strength, Tons of 2000 Lbs.	Working Load Tons of 2000 Lbs.	Dia. Drum or Sheave Advised, Feet	Per Foot
2¾	8⅝	11.95	111	22.2	17	$1.70
2½	7⅞	9.85	92	18.4	15	1.40
2¼	7⅛	8	72	14.4	14	1.17
2	6¼	6.30	55	11	12	.95
1⅞	5¾	5.55	50	10	12	.88
1¾	5½	4.85	44	8.8	11	.80
1⅝	5	4.15	38	7.6	10	.65
1½	4¾	3.55	33	6.6	9	.57
1⅜	4¼	3	28	5.6	8.5	.49
1¼	4	2.45	22.8	4.56	7.5	.40
1⅛	3½	2	18.6	3.72	7	.33
1	3	1.58	14.5	2.90	6	.26
⅞	2¾	1.20	11.8	2.36	5.5	.20
¾	2¼	.89	8.5	1.70	4.5	.16
⅝	2	.62	6	1.20	4	.12
9/16	1¾	.50	4.7	.94	3.5	.10
½	1½	.39	3.9	.78	3	.08½
7/16	1¼	.30	2.9	.58	2.75	.07½
⅜	1⅛	.22	2.4	.48	2.25	.07
5/16	1	.15	1.5	.30	2	.06¾
¼	¾	.10	1.1	.22	1.50	.06½

PLOW STEEL

Dia. Inches	Circumference, Inches	Weight Per Foot, Lbs.	Strength Tons of 2000 Lbs.	Working Load Tons of 2000 Lbs.	Dia. Drum or Sheave Advised, Feet	Per Foot
2¾	8⅝	11.95	275	55	11	$3.00
2½	7⅞	9.85	229	46	10	2.50
2¼	7⅛	8	186	37	9	2.00
2	6¼	6.3	140	28	8	1.58
1⅞	5¾	5.55	127	25	8	1.46
1¾	5½	4.85	112	22	7	1.30
1⅝	5	4.15	94	19	6.5	1.08
1½	4¾	3.55	82	16	6	.93
1⅜	4¼	3	72	14	5.5	.79
1¼	4	2.45	58	12	5	.65
1⅛	3½	1	47	9.4	4.5	.54
1	3	2.58	38	7.6	4	.43
⅞	2¾	1.20	29	5.8	3.5	.34
¾	2¼	.89	23	4.6	3	.26
⅝	2	.62	15.5	3.1	2.5	.19
9/16	1¾	.50	12.3	2.4	2.25	.16
½	1½	.39	10	2	2	.14
7/16	1¼	.30	8	1.6	1.75	.13
⅜	1⅛	.22	5.75	1.15	1.50	.12½
5/16	1	.15	3.8	.76	1.25	.12¼
¼	¾	.10	2.65	.53	1	.12

CRUCIBLE CAST STEEL

Dia., Inches	Circumference, Inches	Weight, Per Foot, Lbs.	Strength, Tons of 2000 Lbs.	Working Load, Tons of 2000 Lbs.	Dia. Drum or Sheave Advised, Feet	Per Foot
2¾	8⅝	11.95	211	42.2	11	$2.10
2½	7⅞	9.85	170	34	10	1.75
2¼	7⅛	8	133	26.6	9	1.44
2	6¼	6.30	106	21.2	8	1.16
1⅞	5¾	5.55	96	19	8	1.02
1¾	5½	4.85	85	17	7	.90
1⅝	5	4.15	72	14.4	6.5	.77
1½	4¾	3.55	64	12.8	6	.66
1⅜	4¼	3	56	11.2	5.5	.56
1¼	4	2.45	47	9.4	5	.46
1⅛	3½	2	38	7.6	4.5	.38
1	3	1.58	30	6	4	.31
⅞	2¾	1.20	23	4.6	3.5	.24
¾	2¼	.89	17.5	3.5	3	.19
⅝	2	.62	12.5	2.5	2.5	.14
9/16	1¾	.50	10	2	2.25	.12
½	1½	.39	8.4	1.68	2	.11
7/16	1¼	.30	6.5	1.30	1.75	.10
⅜	1⅛	.22	4.8	.96	1.50	.09½
5/16	1	.15	3.1	.62	1.25	.09¼
¼	¾	.10	2.2	.44	1	.09

Add 10 per cent to all list prices for wire center or galvanized rope.

EXTRA STRONG CRUCIBLE CAST STEEL

Dia., Inches	Circumference, Inches	Weight, Per Foot, Lbs.	Strength, Tons of 2000 Lbs.	Working Load, Tons of 2000 Lbs.	Dia. Drum or Sheave Advised, Feet	Per Foot
2¾	8⅝	11.95	243	48.6	11	$2.55
2½	7⅞	9.85	200	40	10	2.10
2¼	7⅛	8	160	32	9	1.70
2	6¼	6.3	123	24.6	8	1.34
1⅞	5¾	5.55	112	22.4	8	1.25
1¾	5½	4.85	99	19.8	7	1.10
1⅝	5	4.15	83	16.6	6.5	.94
1½	4¾	3.55	73	14.6	6	.80
1⅜	4¼	3	64	12.8	5.5	.68
1¼	4	2.45	53	10.6	5	.56
1⅛	3½	2	43	8.6	4.5	.46
1	3	1.58	34	6.80	4	.37
⅞	2¾	1.20	26	5.20	3.5	.29
¾	2¼	.89	20.2	4.04	3	.22
⅝	2	.62	14	2.80	2.5	.16½
9/16	1¾	.50	11.2	2.24	2.25	.14
½	1½	.39	9.2	1.84	2	.12½
7/16	1¼	.30	7.25	1.45	1.75	.11½
⅜	1⅛	.22	5.30	1.06	1.50	.11
5/16	1	.15	3.50	.70	1.25	.10¼
¼	¾	.10	2.43	.49	1	.10½

Add 10 per cent to all list prices for wire center or galvanized rope.

GALVANIZED STRAND

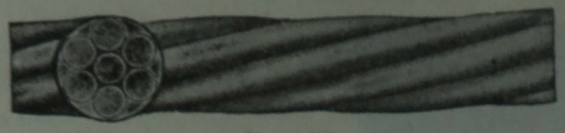


Fig. 1645

Seven steel wires twisted into a single strand. Standard steel strand galvanized or extra galvanized.

This strand is used chiefly for guying poles and smokestacks, for supporting trolley wire, and for operating railroad signals.

Diameter, Inches	Seizing Strand Trade Number	Weight per 1000 Feet, Lbs.	Strength in Lbs.	Per 100 Feet
5/8	..	800	14,000	$8.50
9/16	..	650	11,000	7.00
1/2	..	510	8,500	5.50
7/16	..	415	6,500	4.50
3/8	..	295	5,000	3.50
5/16	..	210	3,800	2.50
1/4	..	125	2,300	1.75
7/32	..	95	1,800	1.50
3/16	..	75	1,400	1.25
5/32	..	55	900	1.15
9/64	18	40	700	1.10
1/8	19	32	500	1.00
7/64	20	25	450	.90
3/32	21	20	400	.80
5/64	22	13	300	.70

EXTRA GALVANIZED SPECIAL STRAND

This class of strand costs more than ordinary strand of equivalent diameter. The higher strength admits of the use of smaller sizes. Lasts longer and is more economical in use.

SIEMENS-MARTIN

Dia., Inches	Tensile Strength, Lbs.	Per 100 Feet	Dia., Inches	Tensile Strength, Lbs.	Per 100 Feet
5/8	19,000	$8.25	9/32	4,380	$2.05
1/2	11,000	5.25	1/4	3,060	1.70
7/16	9,000	4.30	3/16	2,000	1.35
3/8	6,800	3.25	1/8	900	.90
5/16	4,860	2.50			

HIGH STRENGTH

5/8	25,000	$12.00	9/32	7,300	$2.80
1/2	18,000	7.25	1/4	5,100	2.25
7/16	15,000	6.00	3/16	3,300	1.80
3/8	11,500	4.40	1/8	1,500	1.20
5/16	8,100	3.20			

EXTRA HIGH STRENGTH

5/8	42,500	$14.60	9/32	10,900	$3.50
1/2	27,000	8.80	1/4	7,600	2.85
7/16	22,500	7.20	3/16	4,900	2.40
3/8	17,250	5.25	1/8	2,250	1.60
5/16	12,100	4.25			

Note.—When either intermediate sizes and strengths are wanted, if they are exactly midway between two sizes provided for, the average price of the two sizes shall apply; otherwise the price of the nearest size and strength shall apply.

TRANSMISSION OR HAULAGE ROPE

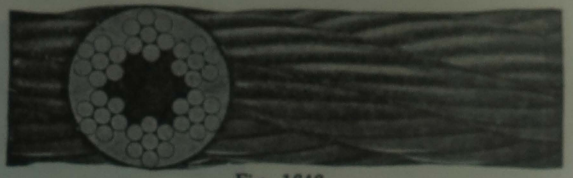


Fig. 1646

6 Strands—7 Wires to the Strand—1 Hemp Core.

EXTRA STRONG CRUCIBLE CAST STEEL

Adaptable for use in mine haulage work. When made galvanized, is used for derrick guys.

Dia., Inches	Circumference, Inches	Weight per Foot, Lbs.	Strength Tons of 2000 Lbs.	Working Load Tons of 2000 Lbs.	Diam. Drum or Sheave Advised, Feet	Per Foot
1 1/2	4 3/4	3.55	73	14.6	11	$0.75
1 3/8	4 1/4	3	63	12.6	10	.64
1 1/4	4	2.45	54	10.8	9	.53
1 1/8	3 1/2	2	43	8.6	8	.44
1	3	1.58	35	7	7	.35
7/8	2 3/4	1.20	28	5.6	6	.27
3/4	2 1/4	.89	21	4.2	5	.20
11/16	2 1/8	.75	16.7	3.3	4 3/4	.17
5/8	2	.62	14.5	2.9	4 1/2	.14 1/4
9/16	1 3/4	.50	11	2.2	4	.12
1/2	1 1/2	.39	8.85	1.8	3 1/2	.09 1/2
7/16	1 1/4	.30	6.25	1.25	3	.07 1/2
3/8	1 1/8	.22	5.25	1.05	2 3/4	.06
5/16	1	.15	3.95	.79	2 1/4	.05 1/2
9/32	7/8	.12 1/2	2.95	.59	1 3/4	.05

Fig. 1647

SHEAVES

FOR WIRE ROPE

Accurately machined and balanced. Sheaves are filled with specially prepared hard rubber securely fitted in place. This filling greatly increases the tractive pull of sheave and prevents excessive wear of rope.

Diameter, Inches	Capacity Rope, Inches	Largest Bore, Inches	Each
18	3/8-7/16-1/2	2 7/16	$13.25
24	3/8-7/16-1/2	2 7/16	18.00
26	3/8-7/16-1/2	2 7/16	20.00
30	3/8-7/16-1/2	2 7/16	21.00
36	3/8-7/16-1/2	2 7/16	28.00
42	3/8-7/16-1/2	2 7/16	34.00
48	3/8-7/16-1/2	2 7/16	37.00
50	3/8-7/16-1/2	2 15/16	39.00
54	3/8-7/16-1/2	2 15/16	42.00
60	3/8-7/16-1/2	2 15/16	48.00
30	5/8-3/4	3 7/16	28.00
36	5/8-3/4	3 7/16	33.00
42	5/8-3/4	3 7/16	37.00
48	5/8-3/4	3 7/16	46.00
54	5/8-3/4	3 7/16	49.00
60	5/8-3/4	3 15/16	58.00
66	5/8-3/4	3 15/16	67.00
72	5/8-3/4	3 15/16	72.00
84	5/8-3/4	3 15/16	98.00
96	5/8-3/4	3 15/16	110.00
108	5/8-3/4	3 15/16	125.00
36	7/8-1	3 15/16	37.50
45	7/8-1	3 15/16	45.90
48	7/8-1	3 15/16	48.00
60	7/8-1	3 15/16	75.00
72	7/8-1	4 15/16	85.00
84	7/8-1	4 15/16	110.00
96	7/8-1	4 15/16	125.00
96	1 1/8-1 1/4	5 15/16	180.00
108	1 1/8-1 1/4	5 15/16	220.00
120	1 1/8-1 1/4	5 15/16	250.00

WIRE ROPE SOCKETS

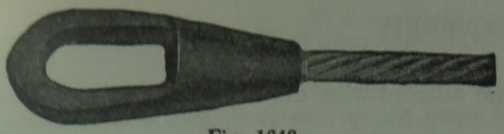


Fig. 1648

CLOSED TYPE

For use with either Steel or Iron Rope. Drop Forged Steel

Circum. Rope, Inches	Dia. Rope, Inches	Loose Each	Fastened Each	Circum. Rope, Inches	Dia. Rope, Inches	Loose Each	Fastened Each
7 1/8	2 1/4	$26.00	$37.00	2 3/4	7/8	$2.50	$4.50
6 1/4	2	24.00	33.50	2 1/4	3/4	1.80	3.30
5 1/2	1 3/4	16.00	24.00	2	5/8	1.35	2.65
5	1 5/8	10.00	16.00	1 3/4	9/16	1.10	2.35
4 3/4	1 1/2	9.00	14.00	1 1/2	1/2	1.00	2.15
4 1/4	1 3/8	6.50	10.75	1 1/4	7/16	.80	1.95
4	1 1/4	6.00	9.50	1 1/8	3/8	.75	1.75
3 1/2	1 1/8	4.00	6.85	1	5/16	.65	1.55
3	1	3.50	5.75	3/4	1/4	.60	1.50

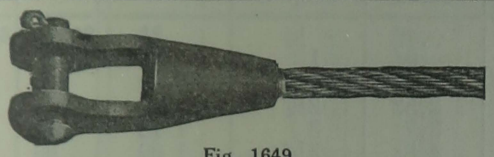


Fig. 1649

OPEN TYPE—WITH PIN

For use with either Steel or Iron Rope

Circum. Rope, Inches	Dia. Rope, Inches	Loose Each	Fastened Each	Circum. Rope, Inches	Dia. Rope, Inches	Loose Each	Fastened Each
7 1/8	2 1/4	$37.00	$48.00	2 3/4	7/8	$3.40	$5.40
6 1/4	2	34.00	43.50	2 1/4	3/4	2.70	4.20
5 1/2	1 3/4	22.00	30.00	2	5/8	2.10	3.40
5	1 5/8	12.50	18.50	1 3/4	9/16	1.70	2.95
4 3/4	1 1/2	11.50	16.50	1 1/2	1/2	1.60	2.75
4 1/4	1 3/8	8.50	12.75	1 1/4	7/16	1.25	2.40
4	1 1/4	8.00	11.50	1 1/8	3/8	1.20	2.20
3 1/2	1 1/8	5.00	7.85	1	5/16	.90	1.80
3	1	4.50	6.75	3/4	1/4	.85	1.75

SISTER HOOKS AND THIMBLES

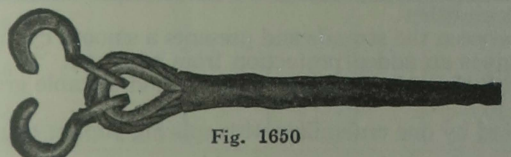


Fig. 1650

Sister hooks are frequently employed where a rope has to be quickly attached and detached from a load and at the same time to hold the load locked in position so long as the rope is under strain. Such devices are frequently used for logging and drawing-in cables.

Diameter Rope, Inches	Circum. Rope, Inches	For Steel Rope, Each, Loose	For Steel Rope, Each, Fastened	For Iron Rope, Each, Loose	For Iron Rope, Each, Fastened
1 1/2	4 3/4	$7.00	$13.50	$5.00	$11.00
1 3/8	4 1/4	5.40	11.15	3.40	8.65
1 1/4	4	4.60	9.20	2.65	6.90
1 1/8	3 1/2	4.40	8.15	2.40	5.90
1	3	3.75	6.70	1.90	4.65
7/8	2 3/4	2.90	5.35	1.40	3.70
3/4	2 1/4	1.85	3.75	1.10	2.85
5/8	2	1.40	2.85	.85	2.20
9/16	1 3/4	1.10	2.40	.75	1.95
1/2	1 1/2	.80	2.05	.65	1.80
7/16	1 1/4	.75	1.95	.60	1.70
3/8	1 1/8	.70	1.85	.55	1.60
5/16	1	.65	1.75	.50	1.50
1/4	3/4	.65	1.75	.50	1.50

THIMBLES

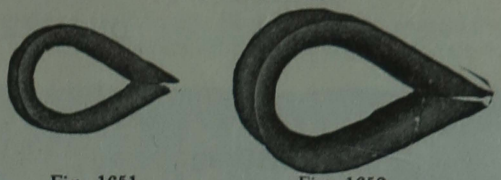


Fig. 1651 Regular

Fig. 1652 Extra Large

GALVANIZED STEEL—OVAL

Size Thimble Width Score, Inches	Circumference Rope, Inches	Diameter Pin that May Be Inserted in Regular Thimble, Inches	Diameter Pin that May Be Inserted in Extra Large Thimble, Inches	Length Inside Regular, Inches	Length Inside Extra Large, Inches	Weight Each, Lbs., Regular	Weight Each, Lbs., Extra Large	Each, Regular
1 1/2	4 3/4	2 9/16	....	3 7/8	4 3/4	1.80	2.20	$0.50
1 3/8	4 1/4	2 7/16	2 11/16	3 7/8	4 1/2	1.40	2.00	.42
1 1/4	4	2 3/8	2 11/16	3 3/4	4 3/8	1.05	1.50	.33
1 1/8	3 1/2	1 15/16	2 1/2	3 3/8	4 1/4	.90	1.20	.28
1	3	1 13/16	2 5/16	3 1/8	4 1/8	.60	.85	.18
7/8	2 3/4	1 9/16	2	2 1/2	3 1/2	.44	.75	.14
3/4	2 1/4	1 7/16	1 3/4	2 3/8	3 1/2	.37	.50	.13
5/8	2	1 1/4	1 9/16	2 1/8	2 7/8	.22	.30	.11
9/16	1 3/4	1 1/8	....	2	...	.13	....	.10
1/2	1 1/2	1 1/16	....	1 7/8	...	.13	....	.09
7/16	1 1/4	1	....	1 3/4	...	.09	....	.08
3/8	1 1/8	7/8	....	1 1/2	...	.06	...	.07
5/16	1	3/4	....	1 1/2	...	.05	....	.06
1/4	3/4	5/8	....	1 3/8	...	.03	....	.05

Prices for Extra Large on Application

WIRE ROPE CLAMPS

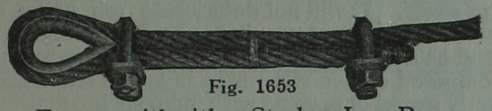


Fig. 1653

For use with either Steel or Iron Rope

Circum. Rope, Inches	Dia. Rope, Inches	Each	Circum. Rope, Inches	Dia. Rope, Inches	Each
7 7/8	2 1/2	$6.00	3	1	$0.35
7 1/8	2 1/4	5.00	2 3/4	7/8	.30
6 1/4	2	4.00	2 1/4	3/4	.23
5 1/2	1 3/4	3.50	2	5/8	.18
4 3/4	1 1/2	.85	1 1/2	1/2	.15
4 1/4	1 3/8	.75	1 1/8	3/8	.12
4	1 1/4	.60	1	5/16	.10
3 1/2	1 1/8	.45	3/4	1/4	.10

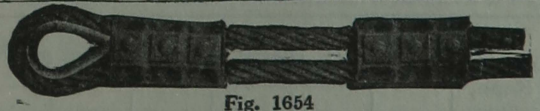


Fig. 1654

For use with either Steel or Iron Rope

MALLEABLE IRON, EXTRA HEAVY

Dia. Rope, Inches	Circum. Rope, Inches	Each	Dia. Rope, Inches	Circum. Rope, Inches	Each
2 1/2	7 1/2	$8.00	1	3	$0.60
2	6 1/4	5.00	7/8	2 3/4	.50
1 3/4	5 1/2	4.00	7/16	2 1/2	.45
1 5/8	5	3.00	3/4	2 1/4	.40
1 7/16	4 1/2	1.50	5/8	2	.35
1 1/4	4	1.10	9/16	1 3/4	.33
1 3/16	3 3/4	.90	1/2	1 1/2	.30
1 1/8	3 1/2	.75	7/16	1 1/4	.28
1 1/16	3 1/4	.65	5/16	1	.25

WIRE HOISTING ROPE

DURABLE—MARLINE COVERED

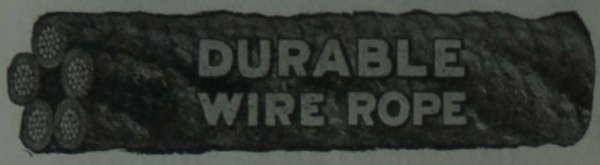


Fig. 1655

Made from selected wire, drawn from the best grades of cast steel and extra heavy cast steel, and is composed of five strands of 19 wires each, each strand separately served with hemp marline. It combines the pliability and wearing surface of hemp or manila rope with the strength of wire rope, overcoming the disadvantages of both.

Diameter in Inches Before Serving with Marline	Approx. Diameter in Inches After Serving with Marline	Approx. Circumference After Serving with Marline	Approximate Breaking Strength in Tons of 2000 Lbs.		Allowable Working Strain in Tons of 2000 Lbs.		Minimum Size of Drum or Sheave, Feet	Approx. Weight per Foot in Lbs.	Per Foot	
			Cast Steel	Extra Strong Cast Steel	Cast Steel	Extra Strong Cast Steel			Cast Steel	Strong Cast Steel
1/4	9/16	1 3/4	2	2.3	.40	.46	1/2	.21	$0.22	$0.24
3/8	5/8	2	4.3	4.7	.86	.94	1	.36	.27	.30
1/2	3/4	2 3/8	7.2	8.1	1.44	1.62	1 1/2	.49	.34	.36
5/8	1	3 1/8	11.2	12.6	2.34	2.52	2 1/4	.80	.42	.47
3/4	1 1/8	3 1/2	15.7	18.5	3.14	3.7	3	1.12	.55	.61
7/8	1 1/4	3 7/8	22.3	24	4.4	4.8	3 1/2	1.29	.66	.73
1	1 3/8	4 5/16	28.5	31	5.7	6.2	4	1.66	.75	.83
1 1/8	1 1/2	4 3/4	36	40	7.2	8.0	4 1/2	2.07	.85	.95
1 1/4	1 5/8	5 1/8	45	50	9.0	10.0	5	2.52	1.04	1.15
1 3/8	1 3/4	5 1/2	55	62	11.0	12.4	5 1/2	3.06	1.24	1.36

For price of six strand rope add 20 per cent to the above list. All sizes not specially listed take an intermediate list.

WIRE TRANSMISSION ROPE

JUPITER—MARLINE COVERED

Suitable for transmitting large amounts of power over medium diameter sheaves through a comparatively small width of space. It will not deteriorate from action of gases and acid fumes, and it does not shrink or stretch under varying conditions of the atmosphere or surroundings. The average amount of total stretch is small, being only about 2 per cent, and as a result numerous periodical shortenings and resplicings are unnecessary.

Composed of five strands of nineteen wires each, similar to standard wire rope construction, but with each strand compactly sewed or covered with tarred hemp marline, and laid up around a blue hemp center core. This marline covering around each strand increases the tractive power of the rope and also provides protection to the wire strands from wear through contact with outside objects and from internal wear on each other.

When but a short time in service the marline becomes packed between the strands and presents a smooth cylindrical surface, especially where a good graphite dressing is used, which gives an added protection from moisture.

It is recommended for use in open American System drives with sheaves of proper diameter and suitable grooves. The use of idlers causing reverse bending of rope is to be avoided.

To insure best operating results splicing should not be attempted by one unfamiliar with splicing Jupiter transmission rope.

If a new rope only is required, particularly for the purpose of increasing the capacity of a present drive, in addition to the above information furnish a templet giving profile of grooves in sheaves upon which rope is to operate.

Table of Horse Power of Jupiter Transmission Rope, Protected Drives. American System

Diameter of Rope, Inches	Speed of Rope in Feet per Minute									*Tension Weight, Lbs.	Minimum Diam. Sheaves, Feet	Approx. Weight Per Foot	Per Foot
	1000	1500	2000	2500	3000	3500	4000	4500	5000				
5/8	7.2	10.6	14	17	19.7	22.1	24.1	25.3	26.6	225	2	.40	$0.27
3/4 Special	8.7	12.8	16.8	20.4	23.5	26.5	29.3	31.2	32.6	275	2 1/2	.45	.325
3/4	12.6	18.7	25.2	30.1	35.4	40.1	44.2	48.2	50.5	375	3	.54	.34
7/8	15.0	22.3	29.3	35.7	42	47.3	52	56	59	450	3 1/2	.60	.38
1 Special	15.2	22.5	29.5	36	42.2	47.6	52.4	56.5	59.2	450	3 1/2	.70	.41
1	18.8	27.8	36.6	44.8	52.5	59.5	65.7	70.8	75	550	4	.80	.42
1 1/8 Special	22.6	33.5	44	53.9	63.1	71.5	78.9	85.2	90.2	650	4 1/2	.96	.505
1 1/8	26.3	39.1	51.3	63	73.8	83.6	92.1	99.6	105.3	775	5	1.12	.55
1 1/4	34.6	51.4	67.8	83.1	98.5	111.1	123.3	133.6	142.6	975	6	1.29	.66

Above, horse-power of one rope based on 180 degrees arc of contact.
To obtain horse-power when rope is exposed to the weather, multiply above values by .666.
*For a rope speed of 3500 feet per minute and carriage operating on level track.

ROPE

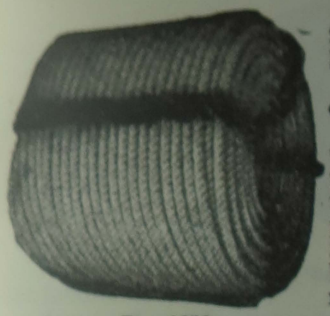


Fig. 1656

The materials employed for rope making are Manila, Sisal and other vegetable fibres. Sisal from Yucatan is largely used for the manufacture of cheaper grades of rope and for binder twine.

Manila Hemp is more extensively used in the manufacture of cordage than any other material, as its great pliancy and strength adapt it to a multitude of uses.

Sisal as a fibre is a substitute for Manila. The length of Manila is usually from 6 feet to 10 feet, while Sisal will average 2 feet to 4 feet. The tensile strength is not more than three-quarters that of Manila. The color of Sisal is yellowish white, sometimes with green tinge. It lacks the gloss and brilliancy of Manila of good grades. Manila is smooth and pliable, Sisal stiff and harsh and easily injured by exposure to moisture and the elements—far more so than Manila. Sisal is used for tying purposes such as lath yarn, tie rope, bundling laths, shingles, lumber, kindling-wood, cooperage stock, hides, leather nursery stock, grain sacks, baling cloth in textile mills, and other uses.

WEIGHT AND STRENGTH OF MANILA ROPE

Diam., Inches	Circum. Inches	Length Manila Rope in 1 Pound		Weight and Length of Coil		Strength New Manila Rope, Lbs.	Diam., Inches	Circum. Inches	Length Manila Rope in 1 Pound		Weight and Length of Coil		Strength, New Manila Rope, Lbs.
		Feet	Inches	Lbs.	Feet				Feet	Inches	Lbs.	Feet	
3/16	1/2	60	....	35	2100	550	15/16	4	2	1	576	1200	14,000
1/4	3/4	55	....	50	2750	620	1 3/8	4 1/4	1	10	648	1200	15,400
5/16	1	41	....	55	2250	1,000	1 1/2	4 1/2	1	8	720	1200	17,000
3/8	1 1/8	27	....	60	1620	1,275	1 9/16	4 3/4	1	6	810	1200	18,400
7/16	1 1/4	18	....	70	1260	1,875	1 5/8	5	1	4	900	1200	20,000
1/2	1 1/2	13	4	90	1200	2,400	1 3/4	5 1/2	1	1	1080	1200	25,000
9/16	1 3/4	9	7	125	1200	3,300	2	6	....	11	1296	1200	30,000
5/8	2	7	6	160	1200	4,000	2 1/8	6 1/2	....	9 1/2	1512	1200	33,000
3/4	2 1/4	6	1	198	1200	4,700	2 1/4	7	....	8	1764	1200	37,000
13/16	2 1/2	5	1	234	1200	5,600	2 1/2	7 1/2	....	7	2016	1200	43,000
7/8	2 3/4	4	5	270	1200	6,500	2 5/8	8	....	6 1/4	2304	1200	50,000
1	3	3	8	324	1200	7,500	2 7/8	8 1/2	....	5 1/2	2590	1200	56,000
1 1/16	3 1/4	3	2	378	1200	8,900	3	9	....	5 1/4	2915	1200	62,000
1 1/8	3 1/2	2	9	432	1200	10,500	3 1/8	9 1/2	....	4 1/2	3240	1200	68,000
1 1/4	3 3/4	2	5	504	1200	12,500	3 1/4	10	....	4	3600	1200	75,000

The weight and strength of Manila rope per table is approximate and may vary slightly either way. Manila and Sisal Standard Rope will weigh about alike. In the lower grades of Manila and Sisal there are greater variations in weight and strength, according to quality. Four strand rope weighs from 5 per cent to 7 per cent heavier than three strand plain laid rope. Manila rope runs approximately 25 per cent stronger than Sisal.

CORDAGE BASIS

Diameter, Inches	Circumference, Inches	Thread	Per Lb. Above Basis	Diameter, Inches	Circumference, Inches	Thread	Per Lb. Above Basis
3/16	1/2	6	$0.02 1/2	1/2	1 1/2	21	$0.01
1/4	3/4	6	.02	1/2 full	1 5/8	24	.01
5/16	1	9	.02	9/16	1 3/4	27	.01
3/8	1 1/8	12	.01 1/2	9/16 full	1 7/8	30	.01
7/16	1 1/4	15	.01	5/8	2	..	.01 1/2
7/16 full	1 3/8	18	.01	3/4	2 1/4 and larger	..	Basis Price

All rope unoiled, 1 cent per pound extra.
All rope in balls, 1/4 cent per pound extra.
Tarred rope, basis.
All 4-strand rope except bolt and transmission, 1 cent per pound extra.
Bolt rope either 3 or 4-strand, 5 cents per pound extra.
All Manila and Sisal goods sold, marked and billed at gross weight.
All prices per pound basis unless otherwise stated.
All cut lengths of rope of less than 600 feet or 100 fathoms, excepting only drilling cables and transmission rope, 1 cent per pound extra.

MANILA TRANSMISSION ROPE

Extra quality of manila rope made expressly for transmission purposes, of long fibres, carefully selected from the highest quality of Manila Hemp only.

This rope is laid up with a special lubricating compound that protects and preserves the fibres. It can be furnished 3-strand without core or 4-strand with core.

Diameter of Rope, Inches	Square of Dia., Inches	Weight per Foot, Lbs.	Breaking Strength, Lbs.	Length in Feet Required for Splice	Smallest Diameter of Sheave, Inches
3/4	.5625	.20	4,500	8	28
7/8	.7656	.26	6,125	8	32
1	1.	.34	8,000	10	36
1 1/8	1.2656	.43	10,125	10	40
1 1/4	1.5625	.53	12,500	10	46
1 3/8	1.8906	.65	15,125	12	50
1 1/2	2.25	.77	18,000	12	54
1 5/8	2.6406	.90	21,125	12	60
1 3/4	3.0625	1.04	24,500	12	64
2	4.	1.36	32,000	14	72

OAKUM

Fig. 1657

Oakum is made of soft vegetable fibre such as hemp and jute, impregnated with pine tar. Made in two classes, known as marine and Plumber's.

Marine oakum is used for all forms of marine caulking work, such as seams on vessels, decks of vessels and caissons. This oakum is made entirely of hemp. Plumbers' oakum is used for caulking all kinds of pipe such as bell and spigot, iron, soil, water supply, waste, sewer and gas. Packed in 50 Lb. bales.

Prices on Application

JUTE PACKING

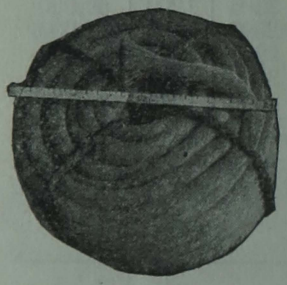


Fig. 1658

Made entirely of Jute, and comes in the form of a rope, about ½ inch in diameter, wound in coils of about 50 lbs. each. Untarred for caulking water supply pipes. Tarred for use on all kinds of pipe caulking; lead, soil and iron pipe.

Prices on Application

HEMP PACKING

Fig. 1659

Made in the form of a rope from pure hemp.

	Per Pound
Italian A. A.	$.....
Italian A	.....
Italian B	.....
American A	.....
American B	.....

Made up in coils of 50 or 100 Lbs.

Prices on Application

LATH AND SHINGLE YARN

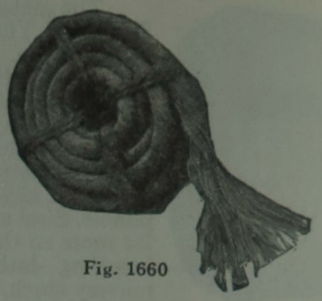


Fig. 1660

Lath Yard is a strand of many ends of tarred yarns, generally Sisal. A strand of medium or No. 130 Lath Yarn contains 130 yarns of medium size, No. 200 or fine contains 200 small yarns, while coarse or No. 110 contains 110 large yarns in the strand.

Coils are usually made up 50, 100 or 200 pounds each.

Lath Yarn, tarred, any size, can be furnished special in single ends.

DIFFERENTIALS

Coarse or B, 100, Tarred, rope basis.
Medium or C, 130, Tarred, rope basis.
Fine or D, 200 Tarred, ½ cent per pound over rope basis.
Double yarn, price on application.

BINDER TWINE

Fig. 1661

For use on grain-harvesting binders, corn-harvesters and for other agricultural purposes. Spun from standard pure sisal.

Put up in flat bales, 5-pound balls and packed 10 balls to the bale.

Prices on Application

SASH CORD

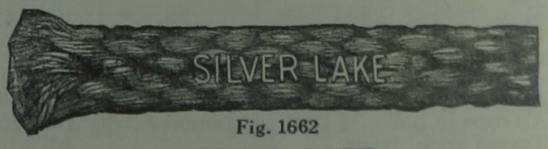


Fig. 1662

SILVER LAKE

Hard braided, fine white cotton yarn; Silver Lake is stamped on every foot of cord. Furnished in hanks of 100 feet or in coils of any length.

NOS.	Diameter, Inches	No. Feet Per Lb.	White Cotton Per Lb.	Drab Cotton Per Lb.
6	3/16	66	$.....	$.....
7	7/32	52	.....	.....
8	1/4	44	.....	.....
9	9/32	36	.....	.....
10	5/16	27	.....	.....
12	3/8	20	.....	.....
14	7/16	14 2/7	.....	.....
16	1/2	10 1/6	.....	.....
18	9/16	9	.....	.....
20	5/8	7 1/2	.....	.....
24	3/4	6	.....	.....
28	7/8	4 1/4	.....	.....
32	1	3 1/2	.....	.....

Prices on Application

STEEL BALLS

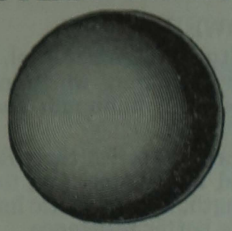


Fig. 1663

Made in different grades and with various tolerances, as follows:

Chrome alloy steel balls: made of the highest grade of chrome alloy steel combining strength, resiliency and durability to a high degree. Made with great care, having a commercial accuracy of .0001 inch in both diameter and sphericity.

High duty steel balls: made of carbon steel; are of the same high grade manufacture as the chrome alloy steel balls, but, due to the difference in material, have not the same crushing strength.

High duty AA steel balls: made of carbon steel but gauged to .0005 inch in diameter and sphericity.

High duty A balls; are seconds from the high duty and high duty AA grades. They have but slight defects invisible to the eye and are suitable for any but the highest service. Gauged to within .001 of an inch.

C grade balls are culls and accumulations from all the other grades. Used where accuracy and appearance are not essential factors.

Size, Inches	Decimal Size, Inches	Number of Balls per Standard Package	Number per Pound	Per 1000
1/8	.1250	3,000	3,400	$3.00
5/32	.1562	3,000	1,770	3.60
3/16	.1875	3,000	1,030	4.00
7/32	.2187	2,000	640	4.80
1/4	.2500	2,000	430	6.00
5/16	.3125	1,000	220	12.00
3/8	.3750	750	125	20.00
7/16	.4375	500	80	28.00
1/2	.5000	500	52	40.00
9/16	.5625	400	36	56.00
5/8	.6250	250	28	68.00
11/16	.6875	200	21	80.00
3/4	.7500	200	16	96.00

Size, Inches	Decimal Size Inches	Number of Balls per Standard Package	Weight Each, Ounces	Per 1000
13/16	.8125	150	1 1/4	$110.00
7/8	.8750	100	1 5/8	130.00
15/16	.9375	100	2	160.00
1	1.000	75	2 3/8	190.00
1 1/8	1.125	50	3 1/2	240.00
1 1/4	1.250	50	4 3/4	310.00
1 3/8	1.375	25	6 1/4	420.00
1 1/2	1.500	25	8	580.00
1 5/8	1.625	25	10	740.00
1 3/4	1.750	25	13	900.00
1 7/8	1.875	25	15 1/2	1100.00
2	2.000	25	19	1400.00

MINIMUM CHARGE FIFTY CENTS ($0.50)

Standard chrome alloy balls are not produced in sizes smaller than 1/4 inch; sizes smaller than 1/4 inch are made of a strong, high carbon steel, as it has been proven that steel balls of these small sizes can be more economically and satisfactorily produced from this grade of material.

UNIVERSAL JOINTS

Fig. 1664

Used on gang drills, woodboring machines, on feed shafts of milling, grinding and special machines, for driving self-aligning boring bars and revolving ventilating funnels on steamships; on printing presses and paper-handling machinery; on motor boats for connecting engine shaft to propeller, etc.

Has great strength, superior wearing qualities and ability to transmit a thrust or tension. Wearing surfaces are case hardened. There are no sharp corners or edges that cut or scrape other parts and no screws or small parts to work loose and get lost. Parts fit accurately without play or looseness and do not rattle. Oil hole in one finger conveys oil to center of block which is recessed. Working angle is limited resulting in strength and economy in power. Furnished with solid blank ends.

STYLE A

NOS.	Outside Dia., Ins.	Lgth., Ins.	Max. Bore, Ins.	Max. Angle Degrees	Weight Each, Lbs.	Extra for Boring, Each	Extra for Boring, Net
1	7/8	2 1/4	7/16	45	5/16	$2.50	$0.75
2	1 1/8	3	5/8	45	3/4	2.75	.85
3	1 7/16	3 3/4	13/16	45	1 7/16	3.20	1.00
4	1 3/4	4 1/2	15/16	45	2 9/16	3.70	1.15
5	2	5 1/4	1 1/16	45	4	4.25	1.30
6	2 1/4	6	1 1/4	30	6 1/4	5.00	1.50
7	2 7/8	7 1/2	1 3/4	30	13	10.00	3.00

The outside diameter of joint should be twice that of the largest shaft with which it is to operate.

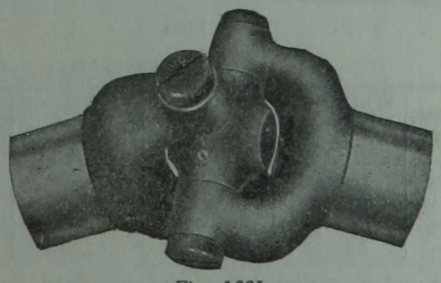


Fig. 1665

BRONZE

For use on motor boats and heavy duty machines. Yokes and centers are made of hard bronze; the studs of special steel. All bearings are provided with oiling device. Designed for an angle of 25 degrees or less.

NOS.	Diameter of Hub, Inches	Length, Inches	Max. Bore, Inches	Weight Each, Lbs.	Each
B1740	1 1/4	4	3/4	1 1/2	$7.00
1741	1 1/2	4 3/4	7/8	2 1/2	9.00
1742	1 3/4	5 1/2	1	4 1/2	12.00
1743	2	6 3/4	1 1/4	7	14.00
1744	2 1/2	8 3/4	1 1/2	15	22.00
1745	3	11 1/4	1 3/4	24	44.00

SHAFTING

FOR THE TRANSMISSION OF POWER

Especially adapted to the transmission of power. Made of the best quality of Bessemer steel, finished accurately to size and absolutely round. All shafts are straightened after keyseating or machining which insures free and true running lines, eliminates the possibility of binding in bearings, reduces friction to a minimum and prevents heating of bearings which is frequently the cause of considerable expense.

For service requiring shafting made of material possessing higher physical properties than Bessemer steel ordinarily used, we can supply shafting made from special stock, including forged nickel steel and forged and annealed vanadium steel. These materials cover the requirements of greater tensile strength, higher elastic limit and are suitable for withstanding extremely heavy shocks and severe vibration. They also have better resistance. While shafting can be furnished of almost any diameter for the transmission of power it is preferable to use such sizes as will harmonize with the standard sizes in which bearings, couplings and other materials listed are manufactured and carried in stock.

Prices for complete shafting specifications will be quoted upon application, or may be figured at base price quoted with net extras added as shown by the table following. The base price for shafting covers only sizes 2¼ to 3 inches diameter, inclusive, in lengths 5 to 24 feet, inclusive. Shafting 6 15/16 inches diameter and smaller is usually made from hot rolled steel bars. Prices for sizes 7 inches diameter and larger, made from forged steel bars, will be quoted upon application.

NET EXTRAS OVER BASE, PER 100 POUNDS

Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus	Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus.	Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus	Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus	Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus	Diam., Ins.	Wgt. Per Foot, Lbs.	Base Plus
1/8	.041	$2.25	1	2.66	$0.30	2 1/8	12.06	$0.15	3 1/4	28.21	$0.25	4 3/8	51.11	$0.80	5 1/2	80.77	$1.50
5/32	.0652	2.25	1 1/16	3.01	.30	2 3/16	12.78	.15	3 5/16	29.30	.25	4 7/16	52.58	.80	5 9/16	82.62	1.50
3/16	.093	1.50	1 1/8	3.38	.25	2 1/4	13.52	Base	3 3/8	30.42	.25	4 1/2	54.08	.90	5 5/8	84.49	1.50
7/32	.1278	1.50	1 3/16	3.77	.25	2 5/16	14.28	Base	3 7/16	31.55	.25	4 9/16	55.59	.90	5 11/16	86.38	1.50
1/4	.166	.90	1 1/4	4.17	.25	2 3/8	15.06	Base	3 1/2	32.71	.50	4 5/8	57.12	.90	5 3/4	88.29	1.50
9/32	.212	.90	1 5/16	4.60	.25	2 7/16	15.87	Base	3 9/16	33.89	.50	4 11/16	58.68	.90	5 13/16	90.22	1.50
5/16	.260	.90	1 3/8	5.05	.25	2 1/2	16.69	Base	3 5/8	35.09	.50	4 3/4	60.25	.90	5 7/8	92.17	1.50
11/32	.3155	.90	1 7/16	5.52	.25	2 9/16	17.53	Base	3 11/16	36.31	.50	4 13/16	61.85	.90	5 15/16	94.14	1.50
3/8	.375	.90	1 1/2	6.01	.15	2 5/8	18.40	Base	3 3/4	37.55	.50	4 7/8	63.47	.90	6	96.13	2.00
7/16	.51	.60	1 9/16	6.52	.15	2 11/16	19.29	Base	3 13/16	38.81	.50	4 15/16	65.10	.90	6 3/16	102.2	2.00
1/2	.666	.60	1 5/8	7.05	.15	2 3/4	20.19	Base	3 7/8	40.10	.50	5	66.76	1.00	6 1/4	104.3	2.00
9/16	.843	.60	1 11/16	7.60	.15	2 13/16	21.12	Base	3 15/16	41.40	.50	5 1/16	68.44	1.00	6 7/16	110.7	2.00
5/8	1.04	.40	1 3/4	8.18	.15	2 7/8	22.07	Base	4	42.73	.80	5 1/8	70.14	1.00	6 1/2	112.8	2.50
11/16	1.26	.40	1 13/16	8.77	.15	2 15/16	23.04	Base	4 1/16	44.07	.80	5 3/16	71.86	1.00	6 3/4	121.7	2.50
3/4	1.50	.40	1 7/8	9.39	.15	3	24.03	Base	4 1/8	45.44	.80	5 1/4	73.60	1.00	6 15/16	128.5	2.50
13/16	1.76	.30	1 15/16	10.02	.15	3 1/16	25.05	$0.25	4 3/16	46.83	.80	5 5/16	75.37	1.00	....	...	...
7/8	2.04	.30	2	10.68	.15	3 1/8	26.08	.25	4 1/4	48.23	.80	5 3/8	77.15	1.00	....	...	...
15/16	2.34	.30	2 1/16	11.36	.15	3 3/16	27.13	.25	4 5/16	49.66	.80	5 7/16	78.95	1.00	....	...	...

KEYSEATING SHAFTING

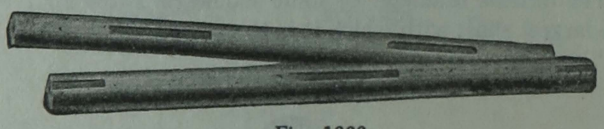


Fig. 1666

Upper shaft shows square end and drilled end keyseats with bottom level full length. Lower shaft shows end keyseats for couplings and middle keyseats for pulleys or gears. These keyseats have milled ends as left by keyseat cutter. Unless otherwise specified, all keyseats will be cut as per lower shaft, and length measurement will be made at bottom of keyseat with milled ends extending beyond actual length.

STANDARD SHAFTING KEYSEAT DIMENSIONS

Shaft Sizes, Inches	Width and Depth, Inches	Shaft Sizes, Inches	Width and Depth, Inches	Shaft Sizes, Inches	Width and Depth, Inches	Shaft Sizes, Inches	Width and Depth, Inches	Shaft Sizes, Inches	Width and Depth, Inches
3/4– 7/8	3/16x3/32	1 11/16–1 7/8	7/16x7/32	2 11/16–2 7/8	11/16–11/32	3 11/16–3 7/8	15/16x15/32	5 7/16–5 5/8	1 3/8x1/2
1 5/16–1 1/8	1/4x1/8	1 15/16–2 1/8	1/2x1/4	2 15/16–3 1/8	3/4x3/8	3 15/16–4 1/8	1 x1/2	5 11/16–6 7/8	1 1/2x5/8
1 3/16–1 3/8	5/16x5/32	2 3/16–2 3/8	9/16x9/32	3 3/16–3 3/8	13/16x13/32	4 3/16 –4 5/8	1 1/8x1/2	6 15/16–7 7/8	1 3/4x3/4
1 7/16–1 5/8	3/8x3/16	2 7/16–2 5/8	5/8x5/16	3 7/16–3 5/8	7/8x7/16	4 11/16–5 3/8	1 1/4x1/2	7 15/16–8 7/8	2 x3/4

Note.—Above dimensions are standard for shafting and all articles to be attached, such as pulleys, sheaves, sprockets, gears, couplings, clutches, etc.

LIST FOR KEYSEATING AND SHOULDERING SHAFTING

Diameter Shaft, Inches	Full Lgth. Per Ft.	For Couplings Per End Milled	Middle Splines				Turning to Reduce Dia. 1/4 In. or Less For 1st Foot	Turning to Reduce Dia. 1/4 In. or Less For 2d Ft. or More	Diameter Shaft, Inches	Full Lght. Per Ft.	For Couplings Per End Milled	Middle Splines				Turning to Reduce Dia. 1/4 In. or less For 1st Foot	Turning to Reduce Dia. 1/4 In. or Less For 2d Ft. or More
			1st Ft. or less Milled	2d Ft. and Over Per Ft.	Extra For Each Drilled End	Extra For Each Sqd. End						1st Ft. or less Milled	2d Ft. and Over Per Ft.	Extra for Each Drilled End	Extra For Each Sqd. End		
1 1/16	$0.16	$0.24	$0.50	$0.16	$0.20	$0.30	$1.30	$0.30	4 5/16	$0.90	$1.40	$1.70	$0.90	$1.00	$1.30	$3.60	$1.20
1 3/16	.20	.30	.60	.20	.30	.40	1.40	.35	4 7/16	1.20	1.70	2.20	1.20	1.10	1.50	4.30	1.30
1 7/16	.24	.40	.70	.24	.40	.50	1.45	.40	5 5/16	1.50	2.00	2.50	1.50	1.30	1.70	4.70	1.45
1 11/16	.30	.50	.80	.30	.50	.60	1.70	.50	5 7/16	2.00	2.50	3.00	2.00	1.50	2.00	5.40	1.55
2 3/16	.40	.60	.90	.40	.60	.70	1.90	.55	6 7/16	2.25	2.75	3.25	2.25	1.80	2.30	6.00	1.65
2 7/16	.50	.80	1.10	.50	.70	.80	2.40	.85	7 7/16	2.50	3.00	3.50	2.50	2.00	2.50	7.10	1.95
2 11/16	.60	1.00	1.30	.60	.80	1.00	2.65	.95	9 7/16	2.75	3.25	3.75	2.75	2.30	2.75	7.90	2.20
3 3/16	.70	1.20	1.50	.70	.90	1.20	3.00	1.10	9 7/16	3.00	3.50	4.00	3.00	2.50	3.00	8.40	2.45

EXTRAS ON FLAT ROLLED STEEL BARS

Fig. 1667

Base price per 100 lbs. will be quoted, to which must be added net extras as follows:

Thickness in Inches	Width in Inches							Thickness in Inches	Width in Inches			
	1/4	5/16–1/2	9/16–23/32	3/4–1	1 1/16–1 1/2	1 9/16–3	Over 3		3/4–1	1 1/16–1 1/2	1 9/16–3	Over 3
1/8–5/32	$8.50	$6.50	$5.50	$4.50	$3.50	$2.50	$2.50	3/4–15/16	$1.25	$1.25	$1.25	$2.50
3/16–5/16	7.50	5.50	5.00	3.50	2.50	1.50	2.50	1 –1 7/16	.....	1.25	1.25	2.50
3/8–7/16	.....	4.50	4.00	2.50	2.50	1.50	2.50	1 1/2–1 11/16	.....	.....	1.25	2.50
1/2–9/16	.....	.....	3.00	1.50	1.50	1.25	2.50	1 3/4–1 15/16	.....	.....	1.25	2.50
5/8–11/16	.....	.....	2.50	1.25	1.25	1.25	2.50	2 –2 15/16	.....	.....	1.25	2.50

WEIGHT PER LINEAL FOOT, IN POUNDS

Width, Inches	Thickness, Inches									
	1/16	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
1/2	.1060	.2125	.319	.425	.531	.638	.744	.850	1.06	1.28
5/8	.1381	.2656	.399	.531	.664	.797	.929	1.06	1.33	1.60
3/4	.1594	.3188	.478	.636	.797	.957	1.116	1.275	1.594	1.913
7/8	.1859	.3720	.558	.743	.929	1.116	1.302	1.487	1.859	2.232
1	.212	.425	.638	.850	1.06	1.28	1.49	1.70	2.12	2.55
1 1/8	.2391	.4782	.717	.959	1.20	1.43	1.68	1.91	2.39	2.87
1 1/4	.2656	.5312	.797	1.06	1.33	1.59	1.86	2.12	2.65	3.19
1 3/8	.292	.585	.875	1.17	1.46	1.76	2.05	2.34	2.92	3.51
1 1/2	.319	.638	.957	1.28	1.59	1.92	2.23	2.55	3.19	3.83
1 5/8	.346	.692	1.04	1.38	1.73	2.08	2.42	2.77	3.46	4.15
1 3/4	.372	.744	1.11	1.49	1.86	2.23	2.60	2.98	3.72	4.47
3	.425	.850	1.28	1.70	2.12	2.55	2.98	3.40	4.25	5.10
2 1/4	.478	.96	1.44	1.91	2.39	2.87	3.35	3.83	4.78	5.75
2 1/2	.531	1.06	1.59	2.12	2.65	3.19	3.72	4.25	5.31	6.38
2 3/4	.585	1.17	1.75	2.34	2.92	3.51	4.09	4.67	5.84	7.02
2	.638	1.28	1.91	2.55	3.19	3.83	4.46	5.10	6.38	7.65
3 1/4	.691	1.38	2.07	2.76	3.45	4.15	4.83	5.53	6.91	8.29
3 1/2	.745	1.49	2.23	2.98	3.72	4.47	5.20	5.95	7.44	8.93
3 3/4	.80	1.59	2.39	3.19	3.99	4.78	5.58	6.38	7.97	9.57
4	.85	1.70	2.55	3.40	4.25	5.10	5.95	6.80	8.50	10.20
4 1/4	.90	1.81	2.71	3.61	4.52	5.42	6.32	7.22	9.03	10.84
4 1/2	.96	1.91	2.87	3.83	4.78	5.74	6.70	7.65	9.57	11.48
4 3/4	1.01	2.02	3.03	4.04	5.05	6.06	7.07	8.08	10.10	12.12
5	1.06	2.13	3.19	4.25	5.31	6.38	7.44	8.50	10.63	12.75
5 1/4	1.116	2.232	3.35	4.46	5.58	6.69	7.81	8.93	11.16	13.39
5 1/2	1.169	2.338	3.51	4.67	5.84	7.02	8.18	9.35	11.69	14.03
5 3/4	1.222	2.444	3.67	4.89	6.11	7.34	8.56	9.77	12.22	14.67
6	1.275	2.550	3.83	5.10	6.38	7.65	8.93	10.20	12.75	15.30
6 1/4	1.328	2.656	3.99	5.31	6.64	7.97	9.29	10.63	13.28	15.94
6 1/2	1.382	2.765	4.14	5.53	6.90	8.29	9.67	11.05	13.81	16.58
6 3/4	1.434	2.869	4.30	5.74	7.17	8.61	10.04	11.48	14.34	17.22
7	1.487	2.975	4.46	5.95	7.44	8.93	10.41	11.90	14.87	17.85
7 1/2	1.594	3.188	4.78	6.36	7.97	9.57	11.16	12.75	15.94	19.13
8	1.70	3.40	5.10	6.80	8.50	10.20	11.90	13.60	17.00	20.40
8 1/2	1.806	3.612	5.42	7.22	9.03	10.84	12.64	14.44	18.06	21.68
9	1.913	3.826	5.74	7.65	9.56	11.48	13.40	15.30	19.13	22.96
9 1/2	2.019	4.037	6.06	8.08	10.10	12.12	14.14	16.16	20.19	24.23
10	2.125	4.25	6.38	8.5	10.62	12.75	14.88	17.00	21.25	25.50
11	2.335	4.676	7.02	9.34	11.68	14.03	16.36	18.70	23.38	28.05
12	2.55	5.10	7.65	10.20	12.75	15.30	17.85	20.40	25.50	30.60

EXTRAS ON COLD FINISHED STEEL AND SHAFTING

Base price per 100 lbs. will be quoted, to which must be added net extras as follows:

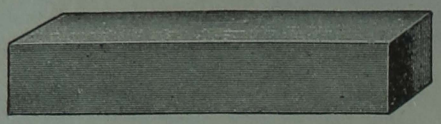


Fig. 1668

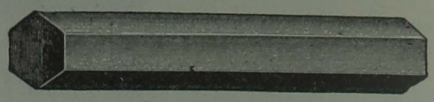


Fig. 1669

SQUARES

Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus
1/8	.053	$3.50	5/8	1.33	$1.00	1 1/8	4.30	$0.70	1 5/8	8.98	$0.60	2 1/8	15.35	$1.00	2 3/4	25.72	$1.50
3/16	.119	3.00	11/16	1.61	.80	1 3/16	4.79	.70	1 11/16	9.68	.60	2 3/16	16.27	1.00	2 15/16	29.34	1.50
1/4	.212	2.00	3/4	1.91	.80	1 1/4	5.31	.70	1 3/4	10.42	.60	2 1/4	17.22	1.00	3	30.61	1.50
5/16	.333	2.00	13/16	2.25	.80	1 5/16	5.85	.70	1 13/16	11.18	.60	2 5/16	18.19	1.00	3 1/4	35.92	2.00
3/8	.478	1.35	7/8	2.60	.70	1 3/8	6.43	.60	1 7/8	11.96	.60	2 3/8	19.18	1.00	3 1/2	41.67	2.00
7/16	.651	1.35	15/16	2.99	.70	1 7/16	7.03	.60	1 15/16	12.77	.60	2 7/16	20.20	1.00	3 3/4	47.82	2.00
1/2	.850	1.00	1	3.40	.70	1 1/2	7.65	.60	2	13.60	.60	2 1/2	21.26	1.50	4	54.40	2.00
9/16	1.08	1.00	1 1/16	3.86	.70	1 9/16	8.30	.60	2 1/16	14.46	1.00	2 5/8	23.43	1.50	...	.....	....

HEXAGONS

Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus	Dia., Ins.	Wght. Per Ft., Lbs.	Base Plus
1/8	.049	$3.50	5/8	1.15	$1.00	1 1/8	3.73	$0.70	1 5/8	7.76	$0.60	2 1/8	13.27	$1.00	2 3/4	22.25	$1.50
3/16	.108	3.00	11/16	1.40	.80	1 3/16	4.15	.70	1 11/16	8.37	.60	2 3/16	14.08	1.00	2 7/8	24.31	1.50
1/4	.195	2.00	3/4	1.66	.80	1 1/4	4.60	.70	1 3/4	9.00	.60	2 1/4	14.85	1.00	3	26.45	1.50
5/16	.29	2.00	13/16	1.91	.80	1 5/16	5.07	.70	1 13/16	9.65	.60	2 5/16	15.80	1.00	...	....	....
3/8	.43	1.35	7/8	2.25	.70	1 3/8	5.57	.60	1 7/8	10.32	.60	2 3/8	16.58	1.00	...	....	....
7/16	.56	1.35	15/16	2.58	.70	1 7/16	6.07	.60	1 15/16	11.00	.60	2 7/16	17.50	1.00	...	....	....
1/2	.73	1.00	1	2.94	.70	1 1/2	6.62	.60	2	11.70	.60	2 1/2	18.37	1.50	...	....	....
9/16	.93	1.00	1 1/16	3.33	.70	1 9/16	7.17	.60	2 1/16	12.51	1.00	2 5/8	20.25	1.50	...	....	....

MISCELLANEOUS NET EXTRAS

QUANTITY DIFFERENTIALS: All specifications for less than 2000 lbs. of a size will be subject to the following extras, the total weight of a size ordered to determine the extra, regardless of length and of the exact quantity actually shipped: 1000 to 1999 lbs., $0.15 per 100 lbs. net. Less than 1000 lbs. $0.35 per 100 lbs. net.

EXTRAS FOR LONG AND SHORT LENGTHS. Per 100 lbs. net: Rounds, 3–5 15/16 in. $1.50: 6–11 15/16 in. $0.75: 12–23 15/16 in. $0.30: 24–59 15/16 in. $0.15. Squares, 3–5 15/16 in. $1.50: 6–11 15/16 in. $0.75: 12–23 15/16 in. $0.60: 24–59 15/16 in. $0.30. Hexagons, 3–5 15/16 in. $1.50: 6–11 15/16 in. $0.75: 12–23 15/16 in. $0.30: 24–59 15/16 in. $0.15. Flats, 3–5 15/16 in. $3.00: 6–11 15/16 in. $1.50: 12–23 15/16 in. $0.75: 24–59 15/16 in. $0.40.

Lengths longer than 24 ft. and less than 30 ft. $0.50 per 100 lbs.: 30 feet and less than 35 ft. $1.00 per 100 lbs: 35 ft. and less than 40 ft. $1.50 per 100 lbs.: 40 ft. and less than 45 ft. $2.00 per 100 lbs.: 45 ft. and longer $2.50 per 100 lbs. This applies to rounds, flats, squares, and hexagons.

EXTRAS FOR CHAMFERING: For automatic screw machine use only. Rounds, 5/8–7/16 in. $0.13 per 100 lbs.: 1 1/16–1 5/16 in. $0.10 per 100 lbs.: 1–2 in. $0.065 per 100 lbs.: 2 1/16 in. and larger $0.04 per 100 lbs. Hexagons and Squares: 7/16–5/8 in. $0.15 per 100 lbs.: 1 1/16–1 5/16 in. $0.13 per 100 lbs.: 1 to 2 in. $.115 per 100 lbs.: 2 1/16 in. and larger $0.10 per 100 lbs. These extras apply to lengths 10 ft. and longer and one end bar only. For sizes smaller than 7/16 in. and bars shorter than 10 ft. special prices will be quoted.

PISTON ROD STEEL: Uniformity to size and carefully selected surface finish $0.50 per 100 lbs. extra, in addition to usual extras for accuracy and short and long lengths.

ROLLER BEARING STEEL: Special analysis and finish for special accuracy, regular extras will apply $1.00 per 100 lbs. net.

EXTRA FOR ODD AND INTERMEDIATE SIZES: The following sizes in rounds, hexagons and squares will be considered standard. By 64ths to 1 in. inclusive: By 32ds, 1 1/32–1 31/32 in. inclusive: By 16ths, 2 in. to makers' limit. All odd and intermediate sizes, excepting those allowing a total tolerance of .008 inches and such specifications will be for not less than 2000 lbs. of a size, not less than $0.25 per 100 lbs. extra, in addition to the usual extras for accuracy, etc.

EXTRAS FOR ACCURACY—ROUNDS. For accuracy from exact size to .0015 inches under, sizes 3 in. diameter and smaller, $0.25 per 100 lbs. net. For accuracy from exact size to .001 inches under, or from exact size to not more than .001 inches either way, sizes 2 1/2 inch diameter and smaller $0.50 per 100 lbs. For accuracy within .0005 inches either way and from exact to .001 inches over size. Size 2 inch diameter and smaller (standard sizes only) $1.00 per 100 lbs. For accuracy .001 inch either way or from exact size to .001 inches over, or from exact size to .001 inches under. Sizes 2 inch diameter and smaller (odd and intermediate sizes) $1.00 per 100 lbs. net.

SQUARES, HEXAGONS AND FLATS—Double above extras.

FOR ACCURACY, CARBON. .31% AND OVER—Double above extras.

EXTRAS FOR SPECIAL AND HIGH CARBON OPEN HEARTH STEELS—Specified analysis—Carbon .30 per cent plus and less, $0.25 per 100 lbs. net. Specified analysis—carbon .30 per cent plus and less, sulphur guaranteed .05 per cent plus and less $0.50 per 100 lbs. net. Specified analysis—Carbon .31 per cent plus to .50 per cent plus $0.50 per 100 lbs net.

BOXING AND BURLAPPING—(Mill Shipments only.) Boxing (minimum $0.50). Domestic shipments $0.40 per 100 lbs.: Export shipment $0.50 per 100 lbs.: Burlapping (minimum $0.25) full length $0.25 per 100 lbs.: ends only $0.10 per 100 lbs.

CONCEALED FAST COLLARS

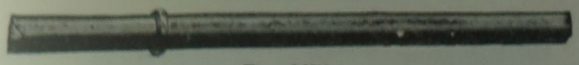


Fig. 1670

NO. T-303

Forged from bar steel, bored slightly under size and shrunk on shaft, then turned and finished on shaft centers, insuring true running.

Only one collar of this type should be used on a line shaft, except where line is connected with loose couplings. In such cases each free section should have one collar.

Size Shaft, Inches	Each	Size Shaft, Inches	Each	Size Shaft, Inches	Each
1 15/16	$2.10	3 7/16	$4.10	5 15/16	$9.40
2 3/16	2.40	3 11/16	4.50	6 7/16	11.00
2 7/16	2.70	3 15/16	4.90	6 15/16	12.80
2 11/16	3.00	4 7/16	5.80	7 7/16	15.00
2 15/16	3.30	4 15/16	6.80	7 15/16	17.50
3 3/16	3.70	5 7/16	8.00		

SAFETY SET COLLARS

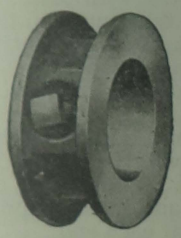


Fig. 1671
Solid

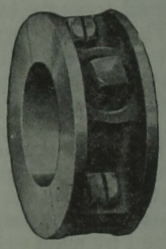


Fig. 1672
Split

Made of cast iron in safety type design; all bolts and set screws are protected by side flanges projecting beyond heads and nuts; made for all sizes of shafting, bored accurately to size, flanges faced each side and turned on outer diameter to insure true running when in position on shaft.

SOLID—NO. T-301

Size Shaft, Ins.	Diameter, Ins.	Width, Ins.	Each	Size Shaft, Ins.	Diameter, Ins.	Width, Ins.	Each
1 5/16	2 1/2	1 11/16	$0.60	3 11/16	6 1/4	2 1/4	$3.30
1 3/16	2 1/2	1 1/16	.80	3 15/16	6 1/2	2 1/4	3.60
1 7/16	2 7/8	1 7/16	1.00	4 7/16	7 1/4	2 1/2	4.70
1 11/16	3 3/8	1 1/2	1.20	4 15/16	8	2 1/2	5.90
1 15/16	3 7/8	1 5/8	1.40	5 7/16	8 1/2	2 1/2	7.20
2 3/16	4 1/8	1 5/8	1.60	5 15/16	9	3	8.60
2 7/16	4 1/2	1 7/8	1.80	6 7/16	9 3/4	3 1/2	10.10
2 11/16	4 3/4	1 7/8	2.10	6 15/16	10 1/4	3 1/2	11.70
2 15/16	5 1/4	2 1/8	2.40	7 7/16	11	3 1/2	13.80
3 3/16	5 1/2	2 1/8	2.70	7 15/16	11 1/2	3 1/2	15.90
3 7/16	6	2 1/4	3.00				

SPLIT—NO. T-302

Size Shaft, Ins.	Diameter, Ins.	Width, Ins.	Each	Size Shaft, Ins.	Diameter, Ins.	Width, Ins.	Each
1 15/16	2 1/2	1 1/16	$0.90	3 11/16	6 3/4	2 1/4	$4.95
1 3/16	2 1/2	1 1/16	1.20	3 15/16	7	2 1/4	5.40
1 7/16	3	1 7/16	1.50	4 7/16	8	2 1/2	7.05
1 11/16	3 3/8	1 1/2	1.80	4 15/16	9	2 1/2	8.85
1 15/16	4	1 5/8	2.10	5 7/16	9 1/2	2 1/2	10.80
2 3/16	4 1/4	1 5/8	2.40	5 15/16	10	3	12.90
2 7/16	4 3/4	1 7/8	2.70	6 7/16	10 1/2	3 1/2	15.15
2 11/16	5	1 7/8	3.15	6 15/16	11	3 1/2	17.55
2 15/16	5 1/2	2 1/8	3.60	7 7/16	11 3/4	3 1/2	20.70
3 3/16	5 3/4	2 1/8	4.05	7 15/16	12 1/4	3 1/2	23.85
3 7/16	6 1/2	2 1/4	4.50				

SHAFT COUPLINGS

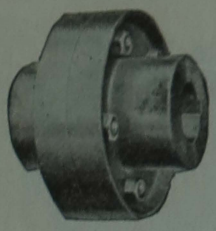


Fig. 1673

FLANGE OR PLATE

NO. T-304

Of uniform design and amply heavy to withstand all ordinary line shaft service. Flanges project beyond bolt heads and nuts so that couplings comply with all legal requirements as to safety.

Each half is bored for a forced fit and finished accurately to template, making them interchangeable and easily duplicated. The bolt holes are reamed to size and fitted with turned steel bolts having finished hexagon nuts. All keyseats in flange couplings are cut tapering.

When couplings are ordered fitted to shafts they are forced on shafts under heavy hydraulic pressure. Taper keys are then fitted, shaft centered in lathe, and the faces of the couplings turned true at right angles to the axis of the shaft, the latter first being restraightened.

In fitting plain face couplings, one shaft projects through its half coupling into the bore of the other half. This makes a male-and-female connection and insures perfect alignment of shafts.

Plain face couplings for connecting shafts of same diameter and male and female face reducing couplings to connect shafts of different diameters are carried in stock in all standard sizes and will be furnished on all orders unless otherwise specified.

Male and female face flange couplings for connecting shafts of same diameter will be made to order and will be charged at an advance of ten per cent over the price of the plain face type.

Finished all over and keys furnished.

Size Shaft, Inches	Outside Diameter, Inches	Length on Shaft, Inches	Each Not Fitted to Shafts	Extra for Fitting to Shafts
1 3/16	6	4 5/8	$7.50	$3.75
1 7/16	6 3/4	5 1/8	8.00	4.00
1 11/16	7 1/4	5 3/4	8.50	4.25
1 15/16	8	6 3/8	9.00	4.50
2 3/16	8 1/2	6 7/8	10.50	4.75
2 7/16	9	7 3/8	12.50	5.25
2 11/16	9 3/4	7 7/8	15.00	5.75
2 15/16	10 1/2	8 3/8	18.50	6.25
3 3/16	10 7/8	8 7/8	22.00	7.00
3 7/16	11 1/4	9 3/8	25.00	7.75
3 11/16	12	10	29.00	8.50
3 15/16	12 1/2	10 5/8	33.50	9.50
4 7/16	13 1/2	13 5/8	43.00	10.50
4 15/16	16 1/4	14 3/8	55.00	11.50
5 7/16	17 1/2	15 1/8	67.00	13.00
5 15/16	19	16 1/8	81.00	14.50
6 7/16	20	16 3/4	96.00	16.50
6 15/16	21	17 1/2	115.00	18.50
7 7/16	22 1/2	18 1/2	135.00	21.00
7 15/16	24	19 1/2	160.00	24.00
8 7/16	27	21	200.00	28.00
8 15/16	27	22	225.00	30.00
9 7/16	30	23	270.00	36.00
9 15/16	30	24	300.00	40.00

For reducing couplings, add 20 per cent to the list price of the larger size.

SEPARATOR PLATES
FOR FLANGE COUPLINGS

NO. T-305

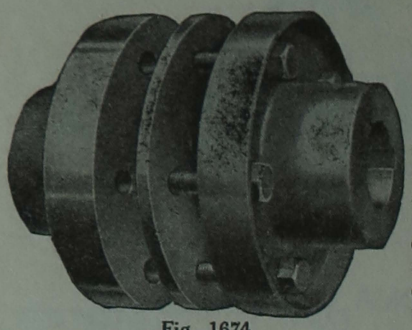


Fig. 1674

Cast iron finished all over, drilled and reamed to match bolt holes of plain face flange couplings. Separator plates are used where it is desired to disconnect a portion of line shaft for any great length of time. Where the connection between couplings is open so that plates may be easily removed, they are made in one piece; but where shaft projects into opposite half of coupling, it is necessary that they be made split.

The list prices below are for plates made in one piece. They can be furnished split or made in two pieces at an increase of twenty-five per cent. When made split, each half is tapped for a bolt that may be used in removing it.

Size Shaft, Inches	Thickness of Plate, Inches	Each	Size Shaft, Inches	Thickness of Plate, Inches	Each
1 3/16	3/8	$4.00	4 7/16	5/8	$16.00
1 7/16	3/8	4.50	4 15/16	5/8	20.00
1 11/16	3/8	5.00	5 7/16	5/8	22.50
1 15/16	3/8	5.50	5 15/16	5/8	25.00
2 3/16	3/8	6.00	6 7/16	3/4	27.50
2 7/16	3/8	6.50	6 15/16	3/4	30.00
2 11/16	1/2	7.00	7 7/16	3/4	32.50
2 15/16	1/2	8.00	7 15/16	3/4	35.00
3 3/16	1/2	9.00	8 7/16	3/4	37.50
3 7/16	1/2	10.00	8 15/16	3/4	37.50
3 11/16	1/2	11.00	9 7/16	1	42.50
3 15/16	1/2	12.00	9 15/16	1	42.50

RIBBED COMPRESSION COUPLINGS

NO. T-308

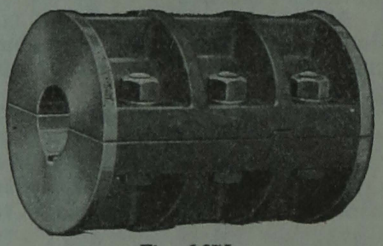


Fig. 1675

This is an exceptionally strong coupling. Correct design combined with ample metal properly distributed make it suitable for very severe service.

Coupling is bored true to shaft size, the halves being separated to allow for clamping when parts are drawn together. The end flanges are faced square with bore and outer diameters of same are turned. It is keyseated for a straight key, the latter being furnished of a square section.

Sizes 2 11/16 inches and smaller have six clamping bolts; larger sizes have eight. The bolt heads and nuts are protected by extended flanges.

If desired, these couplings may be supplied with a protecting cover, for which there is an additional charge.

Size Shaft, Ins.	Diameter, Ins.	Length, Ins.	Each
1 3/16	4 1/8	5 1/2	$4.00
1 7/16	4 3/4	6 1/4	5.00
1 11/16	5	7	6.25
1 15/16	6	8 1/4	7.50
2 3/16	6 3/8	8 7/8	8.75
2 7/16	7 1/4	9 7/8	10.25
2 11/16	7 1/2	10 7/8	11.75
2 15/16	8 3/4	11 3/4	13.50
3 3/16	9 1/4	12 3/4	16.50
3 7/16	10	13 3/4	20.00
3 15/16	10 5/8	14 7/8	30.00
4 7/16	12	16 1/2	40.00
4 15/16	13 5/8	18 1/8	54.00

Prices include keys. For reducing couplings, add 20 per cent to list of the larger size.

DOUBLE CONE COMPRESSION COUPLINGS

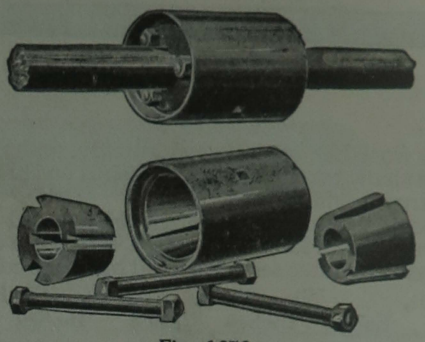


Fig. 1676

NO. T-307

Absolutely the strongest coupling of the compression type; made to transmit full capacity of shafts and an excellent substitute for a flange coupling particularly where facilities for properly fitting the latter are not available.

The two conical parts are bored slightly smaller than shaft size, slotted to allow bore to adapt itself for a gripping fit and keyseated for use with straight keys. Each is turned to same taper on outside concentric with bore.

The shell is bored to match the cones, tapering from the center to each end, both tapers being alike and concentric with the same axis. It is also turned on outside diameter and faced on the ends so that it will run true. Finished all over.

The rectangular slots inside of shell and outside of the cones are provided to carry draw bolts, which, in addition to their function of drawing the cones together, act as keys between these parts. Bolt heads and nuts are protected by shell extending beyond cones at each end.

After placing the various parts of coupling in position, bolts are inserted and gradually tightened, drawing the nuts successively and repeatedly a little at a time, until firmly drawn with equal tension on each.

In drawing up the bolts, an equal pressure is exerted upon each of the cones, which are compressed by being drawn into the shell. This compression of the diameter of the cones causes a consequent contraction of the bores, thus each cone adapts itself to the shaft, and any variation in the exact sizes of the shafts does not distort their true alignment.

To detach couplings, remove the bolts and drive a wedge through opening in outer shell, thus forcing the cones apart.

Size Shaft, Inches	Outside Diameter, Inches	Length Couplings, Inches	*Clearance, Inches	Each
1 15/16	5 1/2	7 7/8	3	$9.00
2 3/16	6	8 5/8	3 3/8	10.25
2 7/16	6 5/8	9 1/2	3 3/4	11.75
2 11/16	7	10 1/4	4 1/8	14.00
2 15/16	7 7/8	11 1/2	4 1/2	17.50
3 3/16	8 1/4	12 1/4	4 7/8	21.00
3 7/16	9	13	5 1/4	24.00
3 11/16	9 5/8	14 1/4	5 5/8	28.00
3 15/16	10 1/8	15	6	33.00
4 7/16	11 1/4	16 1/2	6 3/4	45.00
4 15/16	12 1/4	18	7 1/2	60.00
5 7/16	13 1/4	19 3/4	8 1/4	75.00
5 15/16	14	21 1/2	9	95.00
6 7/16	15 1/4	23 1/4	9 3/4	120.00
6 15/16	16 1/4	25	10 1/2	150.00
7 1/16	17 1/2	27	11 1/4	185.00
7 15/16	18 1/2	29	12	225.00
8 7/16	20 1/2	32	13 1/2	270.00
8 15/16	20 1/2	32	13 1/2	320.00

* Clearance given represents the unobstructed space that must be maintained on shaft on each side of coupling.

Prices include keys.

For reducing couplings, add 20 per cent to list of larger sizes.

COMPRESSION SHAFT COUPLINGS

UNIVERSAL GIANT

Fig. 1677

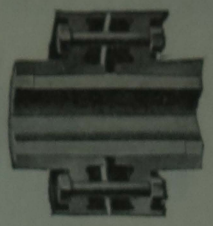


Fig. 1678

NO. T-310

Holds shafts in accurate alignment and without keys, transmits power through the sleeve which grips the shaft by friction. The parts used in the construction of this coupling are the taper sleeve, two flanges and the necessary bolts.

The sleeve is of ample strength to transmit the torsional stress. It is bored slightly smaller than shaft size, has reverse tapers turned on the outside and is slotted lengthwise as per illustration.

The compression flanges are bored to match tapers of sleeve and have the rims turned and edges faced. The bolts are subject to tensional stress only, being used for the purpose of drawing the flanges together thereby compressing the sleeve against shaft. The bolt heads and nuts are fully protected by extension of the flanges.

After placing the parts of coupling in position, the bolts are drawn up successively and repeatedly, a little at a time with equal tension on each until they are sufficiently firm.

The spaces between flanges can be measured with either rule or caliper and by keeping the flanges equi-distant an even positive grip and true running coupling are assured. This space between the two flanges also allows quick removal of coupling by simply inserting a wedge to spread the flanges apart.

Size Shaft, Inches	Diam., Inches	Length, Inches	Clearance, Inches	Each
13/16	5 3/8	4 3/8	2 1/4	$4.75
17/16	6 1/4	5 1/4	2 5/8	5.50
111/16	6 1/2	6 1/8	3 1/8	6.25
115/16	7 3/8	7	3 1/2	8.00
23/16	7 3/4	7 7/8	4	9.00
27/16	9	8 3/4	4 3/8	10.75
211/16	9 1/4	9 5/8	4 7/8	13.00
215/16	10	10 1/2	5 1/4	16.00
33/16	10 3/4	10 1/2	5 1/4	32.50
37/16	12	11 3/8	5 3/4	39.25
311/16	12 1/2	12 1/4	6 1/4	45.25
315/16	13	13	6 3/4	51.25

For reducing couplings, add 20 per cent to list of larger size.

Size Shaft, Ins.	Stgt. Bore Sleeves Each	Reducing Sleeves Each	*Reducing thimbles Each	Flanges Each	Bolts per Set	Wrenches Each
15/16	$1.50	$2.35	$1.50	$1.35	$0.35	$0.40
13/16	1.55	2.50	2.00	1.65	.40	.50
17/16	1.80	2.90	2.00	1.85	.50	.60
111/16	2.00	3.35	2.50	2.10	.50	.60
115/16	2.60	4.20	2.50	2.70	.60	.60
23/16	2.90	4.70	3.00	3.05	.60	.60
27/16	3.50	5.65	3.00	3.70	.80	.70
211/16	4.00	6.60	3.50	4.50	.85	.70
215/16	5.00	8.20	4.00	5.50	1.05	.70
33/16	10.50	17.00	7.00	11.75	1.30	.70
37/16	13.00	20.85	9.00	13.75	1.50	.80
311/16	16.50	25.50	11.50	15.50	1.80	80
315/16	18.50	28.75	13.25	17.50	2.00	.80

*Reducing thimbles are made to fit standard size couplings, same outside diameter as larger shaft, bored for reduction shaft size and are one-half length of sleeve. List prices cover thimbles made not greater than one-half inch thick and bored and turned for shaft sizes listed in above table only.

COMPRESSION SHAFT COUPLINGS

NICHOLSON

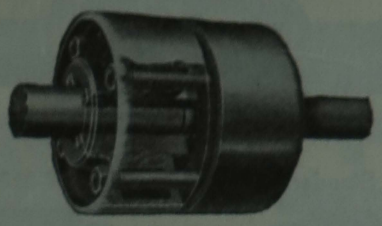


Fig. 1679

NO. T-311

Cannot slip when operating under intermittent loads; keyless type.

Flanges which are bored to match the tapers on the outside of jaws, have turned rims with edges faced square and also contain slots through which jaws pass.

Jaws are of steel, having a double taper turned on outside, conforming to taper bores of the flanges. They are machined concave on their bottom faces which come in contact with shafts, the curve of concave being of a radius slightly less than the radius of the shaft. Bolts draw the flanges together, causing the jaws to grip shafts tightly. So constructed that when flanges are drawn tight, they will stand apart from one-half to one inch according to the size of shaft, and by keeping the space between flanges equi-distant, an even positive grip and a true running coupling is assured. Bolt heads and nuts are protected by extension of flanges.

Reducing couplings of this type are made by using flanges suitable for the larger size shaft, fitted with jaws that accommodate the different diameters of shafts.

Necessary wrenches are furnished without charge.

Size Shaft, Inches	Length Over All, Inches	Diameter Coupling, Inches	Number Jaws	Number Bolts	Each
13/16	5	1/4 5 1/4	3	3	$4.75
17/16	6 1/4	6 1/4	3	3	5.50
111/16	6 3/4	6 7/8	3	3	6.25
115/16	8	7 3/8	4	4	8.00
23/16	8 1/2	8 1/8	4	4	9.00
27/16	10	8 7/16	4	4	10.75
211/16	10 1/2	9 5/16	4	6	13.00
215/16	11 3/4	9 7/8	4	6	16.00
33/16	12 3/4	11 1/8	4	6	19.00
37/16	14 1/4	11 1/2	4	6	23.00
315/16	14 1/2	12 3/4	6	6	30.00
47/16	17 1/4	13 3/8	6	6	42.00
415/16	18	14 7/8	6	6	55.00
57/16	19 3/4	16 1/4	8	6	65.00
515/16	21	16 3/4	8	8	76.00
67/16	22 3/4	17 1/8	8	12	115.00
515/16	22 3/4	17 3/8	8	12	125.00

For reducing couplings, add 20 per cent to list of the larger size.

SOLID SLEEVE SHAFT COUPLINGS

NO. T-309

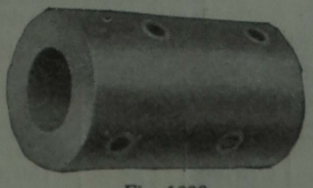


Fig. 1680

Gives very satisfactory service where a comparatively small amount of power is to be transmitted and speed is high.

Finished all over, bored a close fit for shaft and fitted with hollow set screws.

Size Shaft, Inches	Outside Dia., Inches	Length, Inches	Each
15/16	2	3	$3.25
13/16	2 1/2	3 3/4	3.50
17/16	3	4 1/2	4.00
111/16	3 1/2	5 1/2	4.50
115/16	4	6	5.50
23/16	4 1/2	6 3/4	6.50
27/16	5	7 1/2	7.50

SHIFTING JAW CLUTCH COUPLINGS

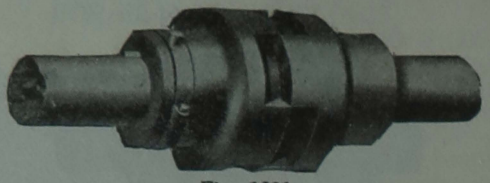


Fig. 1681
Standard Square Jaw—NO. T-313

Fig. 1682
NO. T-312
Left-Hand Spiral Jaw

Fig. 1683
NO. T-314
Right-Hand Spiral Jaw

Finished all over. Jaws are accurately planed to prevent back lash and to insure equal bearing pressure on each. Hubs are the shifting half is grooved and fitted with thrust collars.

Size Shaft, Inches	Outside Dia., Inches	Length on Shaft Open, Inches	Length Tight Half, Inches	Length Shifting Half, Inches	Not Fitted Shafts, Each	Extra for Fitting to Shafts
1 7/16	5	7 1/8	3	3 3/4	$10.00	$4.50
1 11/16	5	7 7/8	3 1/4	4 1/4	11.00	5.00
1 15/16	6 1/2	9 3/8	4	5	13.00	5.50
2 3/16	6 1/2	10	4 1/4	5 3/8	14.50	6.00
2 7/16	8	11 5/8	5	6 1/4	19.00	6.50
2 11/16	8	12 1/4	5 1/4	6 5/8	22.00	7.50
2 15/16	9 1/2	13 7/8	6	7 1/2	28.00	8.50
3 3/16	9 1/2	14 1/2	6 1/4	7 7/8	32.00	9.50
3 7/16	11	16 1/8	7	8 3/4	38.00	10.50
3 11/16	11	16 3/4	7 1/4	9 1/8	44.00	12.00
3 15/16	12 1/2	18 3/4	8	10	52.00	13.50
4 7/16	14 1/2	20 5/8	9	11 1/4	65.00	15.00
4 15/16	14 1/2	21 7/8	9 1/2	12	85.00	17.50
5 7/16	17 1/2	24 5/8	11	13 1/4	110.00	21.00
5 15/16	17 1/2	26 3/8	11 1/2	14 1/2	140.00	25.00

Price includes yoke and end fulcrum for lever.

For reducing couplings, add 20 per cent to list of larger size.

Also furnished with extended sleeves for pulleys, sprockets or gears. Prices on application.

UNIVERSAL JOINT COUPLINGS

NO. T-306

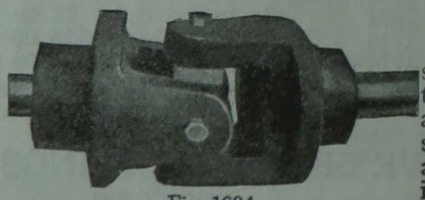


Fig. 1684

Made in either single or double type, the former being suitable for operating shafts intersecting at an angle not exceeding 20 degrees and the latter when angle does not exceed 40 degrees. Not suitable for high-speed service.

Size Shaft, Inches	Diam., Inches	Single Type		Double Type	
		Length, Inches	Each	Length, Inches	Each
1 15/16	8	13 1/2	$70.00	20	$140.00
2 3/16	8	14	75.00	21	150.00
2 7/16	9 1/4	15 1/2	80.00	23	160.00
2 11/16	9 1/4	16	85.00	24	170.00
2 15/16	10 1/2	17 1/2	95.00	26	190.00
3 3/16	10 1/2	18	105.00	27	210.00
3 7/16	12	19 1/2	120.00	29	240.00
3 11/16	12	20	130.00	30	260.00
3 15/16	14	22	150.00	33	300.00

Prices include keys.

For reducing couplings, add 20 per cent to list of larger size.

FLEXIBLE COUPLINGS

BELT TYPE

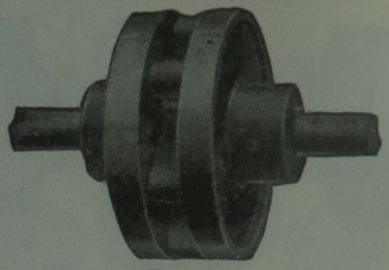


Fig. 1685
NO. T-316

Made to stand severe service, flexible in every direction and suitable for heavy shock loads and high speed.

Used principally to eliminate the necessity of keeping driven shaft in perfect alignment with that of the prime mover and will operate successfully between shafts, the axes of which do not intersect or are at an angle with each other.

Flanges are of cast iron, properly finished, revolving parts being concentric so that they will run true. They are bored and keyseated to suit driving and driven shafts for either slip or press fit. Straight keys with set screws over keyseat are furnished with slip fit and taper keys with press fit.

The pins in type A are of turned steel and are pressed to place and riveted; in type B the pins are of cast iron integral with flanges. A flexible tanned leather belt of high tensile strength and elastic limit is used as the intermediate driving connection and acts also as an insulation between the two halves.

The horse power ratings given in table are maximum at 100 R.P.M. for service under normal conditions and steady load and are proportionate at any number of revolutions up to a peripheral speed of 5000 feet per minute. For intermittent loads or comparatively high starting torque due allowance must be made when using these ratings.

Orders must specify diameters of driving and driven shafts respectively and also whether slip or press fit is desired.

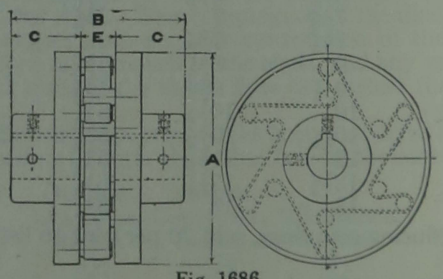


Fig. 1686

Shaft Size, Ins.	Horse Power at 100 RPM	Max. Bore, Ins.	Dimensions in Inches				Each
			Type A Steel Pins		Type B Cast Iron Pins Integral with Flanges		
			A	B	A	B	
1 3/16	2 1/2	1 1/2	7 1/4	6 1/8	7 3/4	6 1/8	$20.00
1 7/16	5	1 3/4	8 5/8	6 7/8	8 7/8	6 7/8	24.50
1 11/16	7	2	9 1/2	7 5/8	10	7 5/8	29.50
1 15/16	10	2 1/2	10	8 1/4	10 3/4	8 1/4	35.00
2 3/16	14	2 3/4	11	8 7/8	11 1/2	8 7/8	41.00
2 7/16	20	3 1/4	12	9 5/8	12 5/8	9 5/8	48.00
2 11/16	27	4	13 3/4	10 3/4	14	10 3/8	58.00
2 15/16	35	4 3/4	14 7/8	11 1/8	15 3/8	11 1/8	70.00
3 7/16	55	6 1/2	17 1/4	11 7/8	17 5/8	11 7/8	95.00
3 15/16	80	7 1/2	19 3/4	13 3/4	20 1/4	13 3/4	130.00
4 7/16	115	19	25 3/8	17	23 3/4	17	180.00

Prices include keys.

Couplings bored for slip fit furnished with straight keys unless otherwise specified.

FLEXIBLE COUPLINGS

FRANCKE—LAMINATED STEEL PIN TYPE

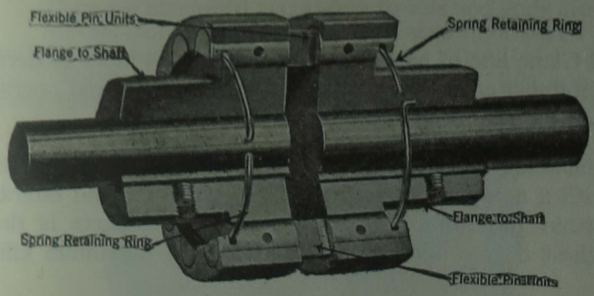


Fig. 1687

NO. T-317

Consists of two cast iron or steel flanges connected by flexible laminated steel pin units instead of rigid bolts.

Each flexible unit consists of a bundle of flat steel springs held flexibly and radially in keepers. One end of each spring has an elongated hole, allowing easy endwise slide in this keeper. The other end of each spring has a round hole and pivots about another small cross pin.

Each flexible pin acts as a laminated beam and does part of the driving and all provide independently for misalignment. The elongated hole allows for endwise float. All springs pivot on keeper cross pins and each spring can bend between supports.

The flat of the spring is held radially and each keeper is held from moving by a snap ring at each end fitting into the continuous groove formed by the cross cut in the keepers and an under cut in the back of each flange.

Used principally for direct connecting motive power to driven machine. They thoroughly absorb vibration and act as a cushion for shock.

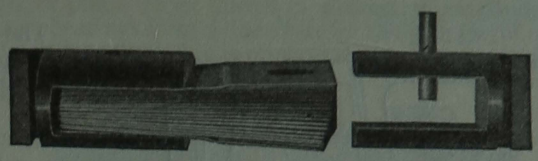


Fig. 1688

Showing laminated steel construction of connecting pins.

SMALL POWER—LIGHT DUTY

Not over 5 H. P. nor over 2000 R.P.M.

NOS.	Maximum Bore, Inches	H. P. Per 100 R.P.M.	Outside Diameter, Inches	Thickness Flanges, Inches	Each
M	3/4	1/3	2 7/16	1 5/32	$18.00
N	1 1/4	1/2	2 15/16	1 5/32	21.00
O	1 1/4	1/3	2 15/16	1 5/32	19.00
P	1 5/8	1 1/3	3 1/2	1 5/32	23.00
Q	1 5/8	2/3	3 1/2	1 5/32	20.00
R	2	2	4	1 5/32	29.00
S	2	1	4	1 5/32	26.00
T	2 1/4	2 3/4	4 1/2	1 7/16	35.00
U	2 1/4	1 3/8	4 1/2	1 7/16	30.00

HEAVY PATTERN COUPLINGS—Shafts up to 12″ Diameter

Use cast iron couplings for all conditions up to maximum R.P.M. listed. Use steel couplings only if speed is above listed cast iron limit.

Size NO.	Max. Bore	H.P. Per 100 R.P.M.	Outside Diameter, Inches	Normal Length on Shaft, Inches	Thickness Flange, Inches	Weight Each, Lbs.	Cast Iron		Steel	
							Max. R.P.M.	Each	Max. R.P.M.	Each
3 1/2	7/8	Up to	3 1/2	4 7/8	1 5/32	8	4000	$23.00	10000	$29.00
4	1 1/4	Up to 2	4	5 1/8	1 5/32	11	4000	29.00	10000	39.00
4 1/2	1 3/8	Up to 2 3/4	4 1/2	5 1/4	1 7/16	13	4000	35.00	10000	45.00
5	1 5/8	Up to 3 3/4	5	5 3/8	1 7/16	18	3500	45.00	8500	56.00
6	2	Up to 6 1/2	6	5 5/8	1 7/16	30	3100	53.00	7600	79.00
7	2 1/2	Up to 9	7	6 1/8	1 7/16	40	2500	63.00	6400	95.00
8 1/2	3	Up to 28	8 1/2	7 5/8	1 3/4	70	2150	83.00	5400	135.00
9 1/2	3 3/4	Up to 45	9 1/2	8 1/8	1 3/4	100	1950	95.00	4850	
10	3 1/2	Up to 65	10	8 3/8	2 3/8	115	1800	105.00	4600	Steel Forging Prices are so high and variable at this time that we prefer to quote larger sizes on application
12	4 1/2	Up to 91	12	9 3/8	2 3/8	180	1500	145.00	3800	
15	6	Up to 145	15	11 1/8	2 3/8	350	1200	200.00	3000	
18	7 3/4	Up to 210	18	13 7/8	2 3/8	500	1000	280.00	2500	
22	10	Up to 300	22	16 7/8	2 3/8	800	800	405.00	2000	
23	8 1/2	Up to 500	23	17	3 1/2	1050	800	490.00	2000	
24	8	Up to 750	24	18 1/2	4 3/4	1300	750	550.00	1900	
27	10	Up to 1000	27	22 1/2	4 3/4	1650	700	650.00	1700	
33	12	Up to 2500	33	26 1/2	5 3/4	3000	575	1050.00	1400	

The normal clearance between flanges should be limited by collars on both shafts to 1/2 inch. The flexible pins will slide to allow float to 3/8 inch minimum or 5/8 inch maximum spacing, but coupling should not be installed or operated close to either limit, as that puts a push or pull on the spring retainer rings. If the spring retainer rings come out or break, it is probable that they have been forced out, and the spacing should be corrected.

The Horse Power ratings given are at 100 R.P.M. and are based on static torque. For different kinds of load it is necessary to select the proper coupling and detailed data will be supplied on application.

Prices include finished straight bore, as required both ends, keyways and set screws, and standard length as given.

Extra length at small extra charge. For Taper Bore and 5 per cent. for each end so bored. Specials for any conditions.

For quotation and in ordering, please specify: 1. Number required. 2. Size number. 3. Bores, both ends. 4. Keyways, both ends. 5. Horse power (normal and maximum). 6. R.P.M. 7. Kind of machines connected.

BALL AND SOCKET HANGERS AND PILLOW BLOCKS

UNIVERSAL GIANT—RING OILING

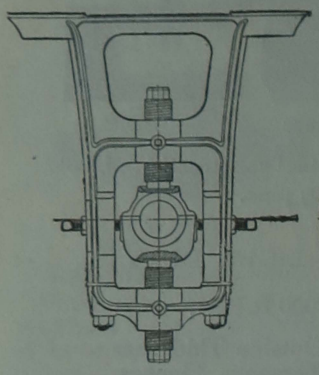


Fig. 1689

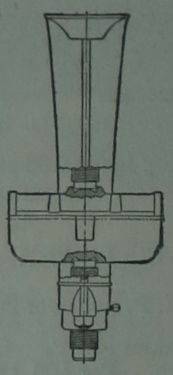


Fig. 1690

The Universal Giant line of hangers and pillow blocks meet modern requirements for obtaining efficiency in erection, maintenance and operation of shafting used for the mechanical transmission of power.

They possess the unique feature of combining a ball and socket movement of bearing with a most satisfactory method of vertical and lateral adjustment, all within the frame. Interchangeability of parts is developed to the highest degree and standardized to give maximum efficiency.

All parts are of sufficient weight to absorb vibration and safely resist shock loads, the metal being distributed to produce the greatest strength at points of greatest stress.

All bearings are susceptible of movement in any direction, giving universal adjustment, ball and socket action and absolutely free alignment with shaft. Necessary corrections in alignment due to settling of building or irregularity of supports is taken care of by adjustment of the bearing within the frame without moving or changing position of hanger.

The above features, particularly that of procuring ball and socket movement of bearing in combination with lateral adjustment of same upon stationary cast iron plungers, will be made clear by reference to line drawings on this page, also the following:

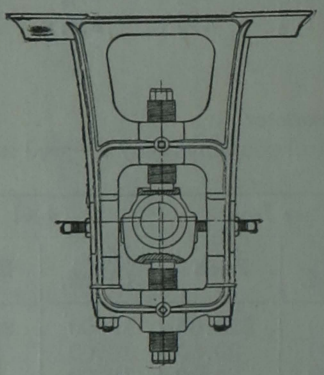


Fig. 1691

The bearing is supported and vertical adjustment is provided by machine cut square threaded cast iron plungers, which also act as guides for the bearing in its lateral movements.

Top and bottom surfaces of the bearing housing that come in contact with flat ends of supporting plungers are sections of a cylinder, the axis of which is at right angles to and intersects axis of shaft at center of bearing.

The bearing may be raised or lowered by adjusting plungers until it is brought to its correct vertical position. It is then free to be moved laterally by adjusting side screws, or if the side screws are kept out of contact with bearing, it is free to move automatically in a lateral direction, and in addition, it is also in position to perform its function of universal adjustment.

After bearing has been adjusted to its correct position, both vertically and laterally, the cylindrical surfaces allow it to literally roll between the ends of the vertical plungers without causing binding or straining of any kind upon the bearing or its supports. It will be noted, this freedom of bearing action allows it to adjust itself instantly and automatically to any angularity of shaft due to deflection, or it is free to maintain its correct position on the shaft should the hanger footing twist or turn.

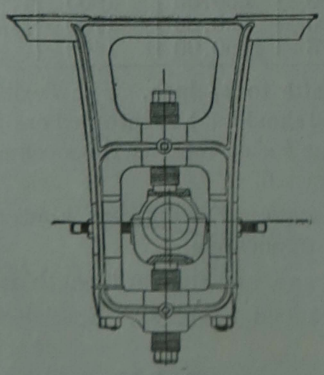


Fig. 1692

The range of vertical and lateral adjustment of drop hangers each side of center is respectively 1 inch and $\frac{3}{8}$ inch.

By means of elongated slots in sides of drop hanger frame, the lateral adjusting screws are permitted to follow the bearing in its movements vertically, and thus bear at all times approximately at the level of shaft center.

In bracket hangers, post hangers and pillow blocks, the vertical adjustment is not as great as in the drop hangers, and it is therefore not necessary to mount the side screws in slots, as the screws in a fixed position will always have contact with bearing at a point not far from the level of shaft center.

BEARINGS FOR UNIVERSAL GIANT HANGERS

All bearings for Universal Giant hangers are lined with a grade of babbitt metal of sufficient hardness to obtain desirable anti-friction qualities and of such a mixture as will allow it to readily conform to shaft without heating.

They are machined accurately to size and ends are faced.

All our hanger bearings can be placed in or taken from hanger or pillow block frames in a direction longitudinally with shaft, which is of much convenience when it is desired to remove bearings from a line shaft for the purpose of cleaning. This feature is of advantage also in erecting line shafting, as in many cases it is unnecessary to remove the yoke from hanger frame. Lengths of all types of bearings are given in table on a following page.

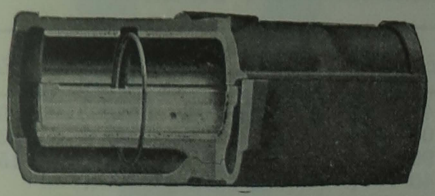


Fig 1693

RING OILING BEARINGS—NO. T-319

This type is accepted as the safest and most efficient shaft bearing to operate under all conditions and it has, therefore, been adopted as a standard to be furnished for all orders unless otherwise specified.

The rings used are made of spring steel, tempered, and will retain perfect shape. Permanent wipers are used to return surplus oil to reservoir, thus using the oil over and over again and also insuring a constant supply.

The bottom of oil reservoir is flat. This construction not only prevents bearing over-turning when out of frame but also eliminates depressions for oil rings which fill with sediment that prevents their free working. In these bearings the oil is the same level the full length of reservoir.

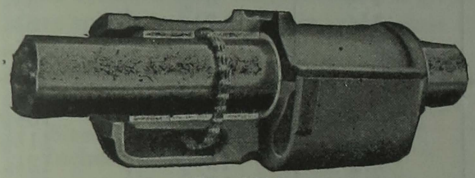


Fig. 1694

CHAIN OILING BEARINGS—NO. T-320

This type of bearing is of same general design and dimensions and may be supplied at same price as the ring oiling type, when required.

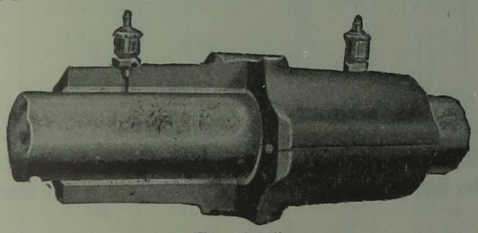


Fig. 1695

PLAIN BEARING—NO. T-321

This type of bearing is furnished where it is desired to use grease as a lubricant. It is practically dust-proof, being fitted with a round wick full length at each side.

Price is same as ring oiling bearing.

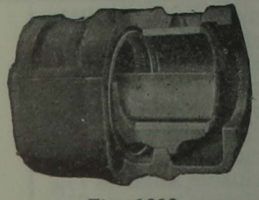


Fig. 1696

SHORT LENGTH RING OILING BEARINGS—NO. T-322

For special requirements short length single ring bearings for use with hangers and pillow blocks can be supplied.

Price is same as standard ring oiling bearing.

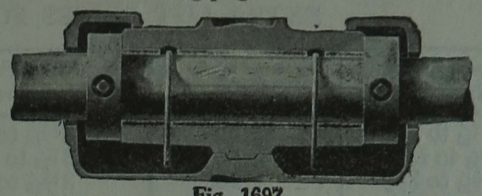


Fig. 1697

COLLAR END BEARINGS—NO. T-323

These bearings can be supplied single or double end either ring or chain oiling type Nos. T-319 and T-320.

When furnished with hangers Nos. T-330 and T-332 standard collars. When furnished with other hangers and adjustable pillow blocks illustrated herein, special collars are necessary. These will be supplied at special discount from standard collar list.

EXTRA LIST PRICES TO BE ADDED TO LIST OF HEADSHAFT HANGERS

Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each
$1\frac{15}{16}$	$2.50	$3\frac{3}{16}$	$4.20	$4\frac{15}{16}$	$8.00
$2\frac{3}{16}$	2.75	$3\frac{7}{16}$	4.75	$5\frac{7}{16}$	9.00
$2\frac{7}{16}$	3.00	$3\frac{11}{16}$	5.50	$5\frac{15}{16}$	10.00
$2\frac{11}{16}$	3.40	$3\frac{15}{16}$	6.25	$6\frac{7}{16}$	11.00
$2\frac{15}{16}$	3.80	$4\frac{7}{16}$	7.00	$6\frac{15}{16}$	12.00

Above prices do not include collars.

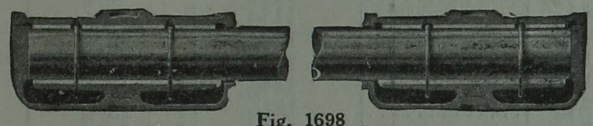


Fig. 1698

CLOSED END BEARINGS—NO. T-324

Bearings of this type may be supplied in ring oiling and chain oiling types and are intended for countershaft use only.

EXTRA LIST PRICES TO BE ADDED TO LIST OF HANGERS

Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each
$1\frac{3}{16}$	$0.50	$2\frac{7}{16}$	$0.90	$3\frac{11}{16}$	$1.60
$1\frac{7}{16}$	.55	$2\frac{11}{16}$	1.00	$3\frac{15}{16}$	1.80
$1\frac{11}{16}$	.60	$2\frac{15}{16}$	1.15	$4\frac{7}{16}$	2.20
$1\frac{15}{16}$	.70	$3\frac{3}{16}$	1.30	$4\frac{15}{16}$	2.60
$2\frac{3}{16}$	.80	$3\frac{7}{16}$	1.45		

Above prices are for each bearing—not per pair.

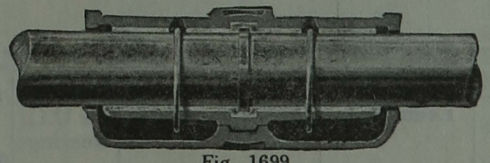


Fig. 1699

RECESSED BEARINGS—NO. T-325

For Concealed Fast Collars

Bearings of this type for use with hangers, Nos. T-330 and T-332, also ball and socket pillow blocks (No. T-342) can be supplied at the following extra list prices:

EXTRA LIST PRICES TO BE ADDED TO LIST OF HEADSHAFT HANGERS

Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each
$1\frac{15}{16}$	$0.70	$3\frac{3}{16}$	$1.30	$4\frac{15}{16}$	$2.60
$2\frac{3}{16}$	.80	$3\frac{7}{16}$	1.45	$5\frac{7}{16}$	3.00
$2\frac{7}{16}$	.90	$3\frac{11}{16}$	1.60	$5\frac{15}{16}$	3.75
$2\frac{11}{16}$	1.00	$3\frac{15}{16}$	1.80	$6\frac{7}{16}$	4.50
$2\frac{15}{16}$	1.15	$4\frac{7}{16}$	2.20	$5\frac{15}{16}$	5.25

Above prices do not include collars.

Above bearings are interchangeable with Universal Giant drop hangers, post hangers and adjustable pillow blocks.

BEARINGS FOR UNIVERSAL GIANT HANGERS

WITH DUST-PROOF ENDS

When bearings Nos. T-319, T-320 and T-322 are required for use in dusty or dirty places, they are supplied with felt washers secured at each end of bearing by plates which are held in position by countersunk slotted head screws.

EXTRA LIST PRICES FOR MAKING BEARINGS DUST PROOF

Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each	Shaft Sizes, Inches	Each
15/16 to 1 1/4	$3.00	2 15/16 to 3 1/4	$5.40	5 7/16 to 6	$10.00
1 7/16 to 1 3/4	3.60	3 7/16 to 3 3/4	6.00	6 7/16 to 7	12.00
1 15/16 to 2 1/4	4.20	3 15/16 to 4	6.90	7 7/16 to 8	15.00
2 7/16 to 2 3/4	4.80	4 7/16 to 5	8.40		

LENGTHS OF HANGER BEARINGS, INCHES

Shaft Sizes, Inches	NO. T-319 NO. T-320 NO. T-323 NO. T-325 For Extra Heavy Head Shaft Hangers	NO. T-319 NO. T-320 NO. T-323 NO. T-325 For Universal Giant Head Shaft Hangers	NO. T-319 NO. T-320 NO. T-324 For Universal Giant Hangers and Pillow Blocks	NO. T-323 For Universal Giant Hangers and Pillow Blocks	NO. T-322 For Universal Giant Hangers and Pillow Blocks	NO. T-32 For Universal Giant Hangers and Pillow Blocks	Distance from Center of Bearing to Outside End of Shaft. No. T-324-6 For Universal Giant Hangers and Pillow Blocks
15/16	.....	.....	5 1/8	5 1/8	4	5 1/16	4
1 3/16	.....	.....	5 1/8	5 1/8	4	5 1/16	4
1 7/16	.....	.....	6 3/16	6 3/16	4 1/2	6 1/16	5 1/8
1 11/16	.....	.....	7 1/4	7 1/4	4 1/2	7 1/8	6 1/8
1 15/16	.....	10 3/8	8 1/4	8 1/4	5	8 1/8	7 1/8
2 3/16	.....	11 1/2	9 5/16	9 5/16	5	9 1/8	8 1/8
2 7/16	.....	12 5/16	10 3/8	10 3/8	6 7/8	10 1/8	9 1/8
2 11/16	.....	13 5/16	11 1/2	11 1/2	6 7/8	11 1/8	10 1/8
2 15/16	.....	14 5/16	12 5/16	12 5/16	7 3/4	12 1/8	11 1/8
3 3/16	.....	15 5/16	13 5/16	13 5/16	7 3/4	12 1/2	12 1/8
3 7/16	.....	16 3/8	14 5/16	14 5/16	8 1/2	13	13
3 11/16	.....	17 3/8	15 5/16	15 5/16	8 1/2	13 1/2	14
3 15/16	18 3/16	18 3/16	16 3/8	16 3/8	9 1/8	14	15
4 7/16	20	20 9/16	18 3/16	18 3/16	10 5/8	15	16 1/2
4 15/16	20	.....	20 9/16	20 9/16	10 5/8	16	18 1/2
5 7/16	24	.....	.....	.....	.....	.....	.....
5 15/16	24	.....	.....	.....	.....	.....	.....
6 7/16	26	.....	.....	.....	.....	.....	.....
6 15/16	26	.....	.....	.....	.....	.....	.....
7 7/16	28	.....	.....	.....	.....	.....	.....
7 15/16	28	.....	.....	.....	.....	.....	.....

A letter is cast upon all Universal Giant Hanger and Pillow Block Frames indicating the sizes of Bearings to be used. The following table explains this feature and serves as a key to list prices used for intermediate shaft sizes:

Odd Sizes	Even Sizes	Regular Listed Sizes	Frames for U.G. Bearings	*Frames for U.G. Head-shaft Bearings	Odd Sizes	Even Sizes	Regular Listed Sizes	Frames for U.G. Bearings	*Frames for U. G. Head-shaft Bearings
15/16 to 1 1/4 ins. inclusive same as 1 3/16			A		3 13/16 to 4 ins. inclusive same as 3 15/16			G	H
1 5/16 to 1 1/2 ins. inclusive same as 1 7/16			B		4 1/16 to 4 1/2 ins. inclusive same as 4 7/16			H	
1 9/16 to 1 3/4 ins. inclusive same as 1 11/16			B		4 9/16 to 5 ins. inclusive same as 4 15/16			H	
1 13/16 to 2 ins. inclusive same as 1 15/16			C	D	5 1/16 to 5 1/2 ins. inclusive same as 5 7/16				
2 1/16 to 2 1/4 ins. inclusive same as 2 3/16			C	D	5 9/16 to 6 ins. inclusive same as 5 15/16				
2 5/16 to 2 1/2 ins. inclusive same as 2 7/16			D	E	6 1/16 to 6 1/2 ins. inclusive same as 6 7/16				
2 9/16 to 2 3/4 ins. inclusive same as 2 11/16			D	E	6 9/16 to 7 ins. inclusive same as 6 15/16				
2 13/16 to 3 ins. inclusive same as 2 15/16			E	F	7 1/16 to 7 1/2 ins. inclusive same as 7 7/16				
3 1/16 to 3 1/4 ins. inclusive same as 3 3/16			E	F	7 9/16 to 8 ins. inclusive same as 7 15/16				
3 5/16 to 3 1/2 ins. inclusive same as 3 7/16			F	G					
3 9/16 to 3 3/4 ins. inclusive same as 3 11/16			F	G					

*Drop Hanger, Bracket Hanger, Post Hanger and Pillow Block Frames.

Note.—Head Shaft Bearings may be used in Universal Giant Bracket Hanger, Post Hanger, and Pillow Block Frames, the same as in Drop Hanger Frames.

BALL AND SOCKET DROP HANGERS

UNIVERSAL GIANT—PATENTED RING OILING

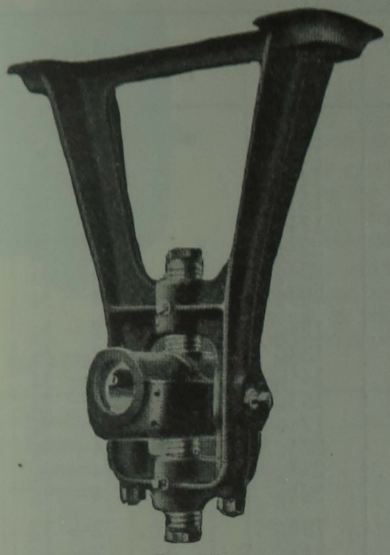


Fig. 1700

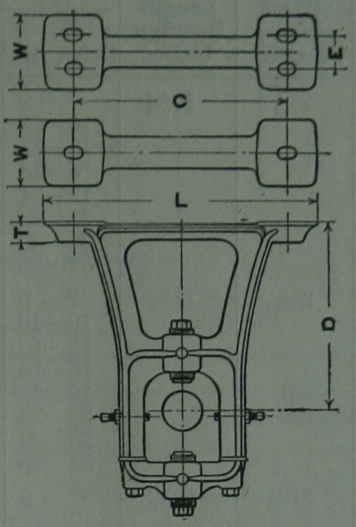


Fig. 1701

These hangers are designed and constructed on scientific principles involving unique adjusting and practical power saving features. The ball and socket movement of the bearing combined with the vertical and lateral adjustment within the frame makes the alignment of the shaft a simple and inexpensive operation.

Detailed description of these hangers is given on foregoing pages. Ring oiling bearings (**NO. T-319**) are furnished unless orders specify other types, in which case they must be shipped from the factory.

Frame Symbol	Shaft Sizes, Inches	Length Bearings, Inches	D, Drop, Inches	Dimensions, Inches					Bolts Required	Each
				L	W	T	C	E		
A	1 3/16	5	7— 9	12	3 1/2	1	8 5/8		2—7/16	$4.60
			10—12	13 5/8	3 1/2	1	10 3/16		2—7/16	5.00
			13—15	15 1/4	4	1	11 3/4		2—7/16	5.40
			16—18	16 7/8	4 1/2	1	13 3/8		2—7/16	5.90
			19—21	18 1/2	5	1	15		2—7/16	6.40
B	1 7/16	6 1/8	7— 9	13 1/4	4	1 1/8	9 1/2		2—5/8	5.20
			10—12	14 3/8	4	1 1/8	10 5/8		2—5/8	5.60
			13—15	15 1/2	4 1/2	1 1/8	11 13/16		2—5/8	6.20
			16—18	16 11/16	5	1 1/8	13		2—5/8	6.70
			19—21	17 7/8	5 1/2	1 1/8	14 3/16		2—5/8	7.40
			23—25	22	6	1 1/4	18	2 1/2	4—5/8	8.25
B	1 11/16	7 1/4	7— 9	13 1/4	4	1 1/8	9 1/2		2—5/8	5.70
			10—12	14 3/8	4	1 1/8	10 5/8		2—5/8	6.10
			13—15	15 1/2	4 1/2	1 1/8	11 13/16		2—5/8	6.70
			16—18	16 11/16	5	1 1/8	13		2—5/8	7.20
			19—21	17 7/8	5 1/2	1 1/8	14 3/16		2—5/8	7.90
			23—25	22	6	1 1/4	18	2 1/2	4—5/8	8.75
C	1 15/16	8 1/4	7— 9	14 15/16	4 1/2	1 1/4	10 15/16		2—5/8	7.25
			10—12	16 3/16	4 1/2	1 1/4	12 3/16		2—5/8	7.75
			13—15	17 3/8	5	1 1/4	13 7/16		2—5/8	8.35
			16—18	18 5/8	5 1/2	1 1/4	14 5/8		2—5/8	9.00
			19—21	19 7/8	6	1 1/4	15 7/8		2—5/8	9.75
			23—25	26	6 1/2	1 1/2	21 11/16	3	4—5/8	10.50
			28—30	30	7	1 1/2	25 3/4	3	4—5/8	13.50
C	2 3/16	9 1/4	7— 9	14 15/16	4 1/2	1 1/4	10 15/16		2—5/8	8.25
			10—12	16 3/16	4 1/2	1 1/4	12 3/16		2—5/8	8.75
			13—15	17 3/8	5	1 1/4	13 7/16		2—5/8	9.35
			16—18	18 5/8	5 1/2	1 1/4	14 5/8		2—5/8	10.00
			19—21	19 7/8	6	1 1/4	15 7/8		2—5/8	10.75
			23—25	26	6 1/2	1 1/2	21 11/16	3	4—5/8	11.50
			28—30	30	7	1 1/2	25 3/4	3	4—5/8	14.50

Balance of price list on the following page

BALL AND SOCKET DROP HANGERS

UNIVERSAL GIANT—PATENTED RING OILING

Frame Symbol	Shaft Sizes, Inches	Length Bearings, Inches	Dimensions, Inches						Bolts Required	Each
			D, Drop, Inc.	L	W	T	C	E		
D	2 7/16	10 3/8	7— 9	16 5/8	5 1/2	1 3/8	12 3/16		2— 3/4	$10.20
			10—12	17 7/8	5 1/2	1 3/8	13 7/16		2— 3/4	11.00
			13—15	19 1/8	6	1 3/8	14 11/16		2— 3/4	12.00
			16—18	20 3/8	6 1/2	1 3/8	15 7/8		2— 3/4	13.00
			19—21	21 5/8	6 3/4	1 3/8	17 1/8		2— 3/4	14.00
			23—25	26 5/8	7 1/2	1 1/2	22 1/8	3	4— 3/4	15.50
			28—30	30	8	1 1/2	25 1/2	3	4— 3/4	18.50
			34—36	34	8 1/2	1 1/2	29 1/2	3	4— 3/4	22.00
D	2 11/16	11 3/8	7— 9	16 5/8	5 1/2	1 3/8	12 3/16		2— 3/4	11.45
			10—12	17 7/8	5 1/2	1 3/8	13 7/16		2— 3/4	12.25
			13—15	19 1/8	6	1 3/8	14 11/16		2— 3/4	13.25
			16—18	20 3/8	6 1/2	1 3/8	15 7/8		2— 3/4	14.25
			19—21	21 5/8	6 3/4	1 3/8	17 1/8		2— 3/4	15.25
			23—25	26 5/8	7 1/2	1 1/2	22 1/8	3	4— 3/4	16.75
			28—30	30	8	1 1/2	25 1/2	3	4— 3/4	19.75
			34—36	34	8 1/2	1 1/2	29 1/2	3	4— 3/4	23.25
E	2 15/16	12 3/8	7— 9	18 3/8	6	1 1/2	13 9/16		2— 7/8	14.50
			10—12	19 9/16	6 3/8	1 1/2	14 3/4		2— 7/8	15.50
			13—15	20 7/8	6 3/4	1 1/2	15 7/8		2— 7/8	17.00
			16—18	22 1/16	7	1 1/2	17 1/8		2— 7/8	18.50
			19—21	23 1/4	7 1/2	1 1/2	18 3/8		2— 7/8	20.00
			23—25	28 5/16	8	1 5/8	23 3/8	3 1/4	4— 3/4	21.50
			28—30	31 11/16	8 1/2	1 5/8	26 7/8	3 1/4	4— 3/4	25.00
			34—36	36	9	1 5/8	31 1/16	3 1/4	4— 3/4	29.00
E	3 3/16	13 1/4	7— 9	18 3/8	6	1 1/2	13 9/16		2— 7/8	16.00
			10—12	19 9/16	6 3/8	1 1/2	14 3/4		2— 7/8	17.00
			13—15	20 7/8	6 3/4	1 1/2	15 7/8		2— 7/8	18.50
			16—18	22 1/16	7	1 1/2	17 1/8		2— 7/8	20.00
			19—21	23 1/4	7 1/2	1 1/2	18 3/8		2— 7/8	21.50
			23—25	28 5/16	8	1 5/8	23 3/8	3 1/4	4— 3/4	23.00
			28—30	31 13/16	8 1/2	1 5/8	26 7/8	3 1/4	4— 3/4	26.50
			34—36	36	9	1 5/8	31 1/16	3 1/4	4— 3/4	30.50
F	3 7/16	14 1/4	10—12	21 1/2	6 1/2	1 3/4	16 1/4	3 1/4	4— 7/8	22.50
			13—15	22 1/2	7	1 3/4	17	3 1/4	4— 7/8	24.00
			16—18	23 1/2	7 1/2	1 3/4	18	3 1/4	4— 7/8	25.50
			19—21	24 1/2	8	1 3/4	19	3 1/4	4— 7/8	27.00
			23—25	29 1/2	8 1/2	1 3/4	24	4	4— 7/8	29.50
			28—30	32 1/2	9	1 3/4	27	4	4— 7/8	33.00
			34—36	36	9 1/2	1 3/4	30 1/2	4	4— 7/8	37.00
F	3 11/16	15 1/2	10—12	21 1/2	6 1/2	1 3/4	16 1/4	3 1/4	4— 7/8	24.50
			13—15	22 1/2	7	1 3/4	17	3 1/4	4— 7/8	26.50
			16—18	23 1/2	7 1/2	1 3/4	18	3 1/4	4— 7/8	27.50
			19—21	24 1/2	8	1 3/4	19	3 1/4	4— 7/8	29.00
			23—25	29 1/2	8 1/2	1 3/4	24	4	4— 7/8	31.00
			28—30	32 1/2	9	1 3/4	27	4	4— 7/8	35.00
			34—36	36	9 1/2	1 3/4	30 1/2	4	4— 7/8	39.00
G	3 15/16	16 1/2	10—12	23 1/2	7	2	17 1/2	3 1/4	4—1	29.00
			13—15	24 1/2	7 1/2	2	18 1/2	3 1/4	4—1	31.00
			16—18	25 1/2	8	2	19 1/2	3 1/4	4—1	33.00
			19—21	26 1/2	8 1/2	2	20 1/2	3 1/4	4—1	35.50
			23—25	30 1/4	9	2	24 1/4	4 1/2	4—1	38.50
			28—30	33	9 1/2	2	27	4 1/2	4—1	42.00
			34—36	36	10	2	30	4 1/2	4—1	47.00
H	4 7/16	18 1/2	10—12	26 3/4	8	2 1/4	20 1/2	3 1/2	4—1 1/8	40.00
			13—15	28 1/4	8 1/2	2 1/4	22 1/4	3 1/2	4—1 1/8	43.00
			16—18	30	9	2 1/4	23 3/4	3 1/2	4—1 1/8	46.00
			19—21	31 1/2	9 1/2	2 1/4	25 3/8	5	4—1 1/8	49.00
			23—25	33 3/4	10	2 1/4	27 1/2	5	4—1 1/8	54.00
			28—30	36 1/2	10 1/2	2 1/4	30	6	4—1 1/8	60.00
			34—36	39 1/2	11	2 1/4	33 1/4	6	4—1 1/8	70.00
H	4 15/16	20 1/2	10—12	26 3/4	8	2 1/4	20 1/2	3 1/2	4—1 1/8	45.00
			13—15	28 1/4	8 1/2	2 1/4	22 1/4	3 1/2	4—1 1/8	48.00
			16—18	30	9	2 1/4	23 3/4	3 1/2	4—1 1/8	51.00
			19—21	31 1/2	9 1/2	2 1/4	25 3/8	5	4—1 1/8	54.00
			23—25	33 3/4	10	2 1/4	27 1/2	5	4—1 1/8	59.00
			28—30	36 1/2	10 1/2	2 1/4	30	6	4—1 1/8	65.00
			34—36	39 1/2	11	2 1/4	33 1/4	6	4—1 1/8	75.00

ADJUSTABLE BALL AND SOCKET POST HANGERS

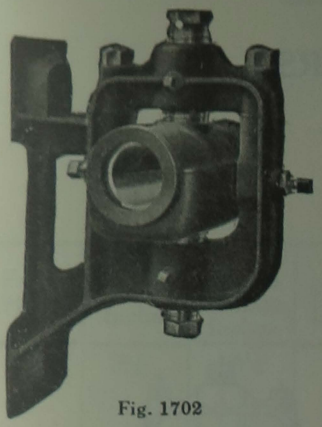


Fig. 1702

UNIVERSAL GIANT
PATENTED RING OILING

NO. T-327

Universal Giant Post Hangers embody the adjusting features as described on a preceding page.

They can be inverted when necessary, as the yoke is the same as is used on regular Universal Giant Drop Hangers.

Ring oiling bearings are always furnished unless orders specify other types, in which case they must be shipped from factory.

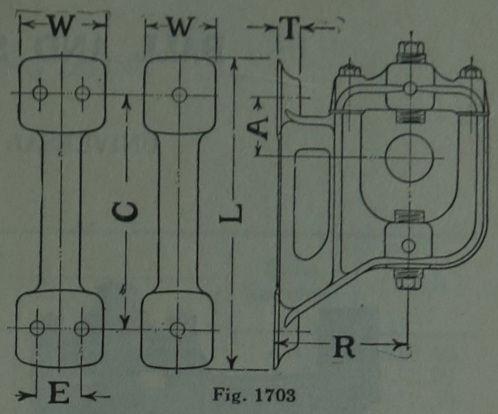


Fig. 1703

Frame Symbol	Shaft Sizes, Inches	Dimensions, Inches								Bolts Required	Each
		Length Bearings	R Reach	L	W	T	A	C	E		
A	1 3/16	5	5 7/8	11 1/4	3	1	2 1/4	8 1/4		2— 7/16	$5.00
B	1 7/16	6 1/8	5 7/8	14 1/4	4	1 1/8	2 1/2	10 5/16		2— 1/2	5.60
	1 11/16	7 1/4	5 7/8	14 1/4	4	1 1/8	2 1/2	10 5/16		2— 1/2	6.10
C	1 15/16	8 1/4	6 3/8	15 1/8	4 1/2	1 1/4	3	11 1/8		2— 5/8	7.25
	2 3/16	9 1/4	6 3/8	15 1/8	4 1/2	1 1/4	3	11 1/8		2— 5/8	8.25
D	2 7/16	10 3/8	7 3/8	18 3/16	5	1 3/8	3 7/16	13 3/4		2— 3/4	11.00
	2 11/16	11 3/8	7 3/8	18 3/16	5	1 3/8	3 7/16	13 3/4		2— 3/4	12.25
E	2 15/16	12 3/8	8 3/8	20 3/4	5 1/2	1 1/2	3 3/4	15 3/4		2— 7/8	16.00
	3 3/16	13 1/4	8 3/8	20 3/4	5 1/2	1 1/2	3 3/4	15 3/4		2— 7/8	17.50
F	3 7/16	14 1/4	10	22 1/2	6	1 3/4	4 3/8	16 3/8	2 1/2	4— 7/8	24.00
	3 11/16	15 1/2	10	22 1/2	6	1 3/4	4 3/8	16 3/8	2 1/2	4— 7/8	26.00
G	3 15/16	16 1/2	12	25 1/2	7	2	4 7/8	19	2 3/4	4—1	32.00
H	4 7/16	18 1/2	14	29 1/2	8 3/8	2 1/4	6 1/4	22 1/4	3 1/2	4—1 1/8	48.00
	4 15/16	20 1/2	14	29 1/2	8 3/8	2 1/4	6 1/4	22 1/4	3 1/2	4—1 1/8	53.00

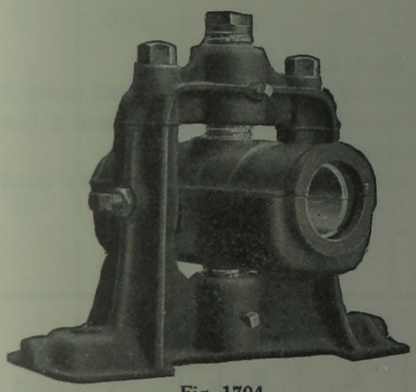


Fig. 1704

ADJUSTABLE PILLOW BLOCKS

UNIVERSAL GIANT
PATENTED RING OILING

NO. T-328

Universal Giant Pillow Blocks embody the adjusting features described on foregoing pages.

The feature of lateral adjustment obtained on stationary supporting plungers makes this pillow block in many cases preferable to the ordinary combination of rigid pillow block and adjustable base plate.

A short drop hanger is obtained by using this frame with inverted bearing.

Ring oiling bearings are furnished unless orders specify other types, in which case they must be shipped from factory.

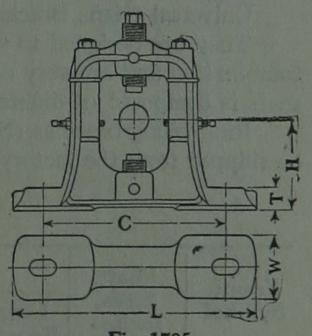


Fig. 1705

Frame Symbol	Shaft Sizes, Inches	Dimensions, Inches							Bolts Required	Each
		Lengths, Bearings	H Height Pillow Block	H Drop Short Hanger	L	W	T	C		
A	1 3/16	5	3 7/8	3 1/2	10 3/8	2 3/4	1	7 13/16	2— 7/16	$4.60
B	1 7/16	6 1/8	5 1/8	4 5/8	12 3/8	4	1 1/8	9	2— 1/2	5.20
	1 11/16	7 1/4	5 1/8	4 1/2	12 3/8	4	1 1/8	9	2— 1/2	5.70
C	1 15/16	8 1/4	5 7/16	4 15/16	13 3/4	4 3/4	1 1/4	10 1/4	2— 5/8	7.00
	2 3/16	9 1/4	5 7/16	4 13/16	13 3/4	4 3/4	1 1/4	10 1/4	2— 5/8	8.00
D	2 7/16	10 3/8	6 5/8	5 7/8	16 3/4	5 1/2	1 3/8	12	2— 3/4	10.20
	2 11/16	11 3/8	6 5/8	5 3/4	16 3/4	5 1/2	1 3/8	12	2— 3/4	11.45
E	2 15/16	12 3/8	6 7/8	6 1/8	18 1/4	6	1 1/2	13 5/16	2— 7/8	15.00
	3 3/16	13 1/4	6 7/8	6	18 1/4	6	1 1/2	13 5/16	2— 7/8	16.50
F	3 7/16	14 1/4	8	7 1/4	21 1/4	7	1 5/8	15 5/16	2—1	22.50
	3 11/16	15 1/2	8	7 1/8	21 1/4	7	1 5/8	15 5/16	2—1	24.50
G	3 15/16	16 1/2	8 1/2	7 1/2	24	8	1 3/4	17 1/4	2—1 1/8	28.50
H	4 7/16	18 1/2	10	8 7/8	25 3/4	8 1/2	2 1/4	20 1/2	2—1 1/4	40.00
	4 15/16	20 1/2	10	8 3/4	25 3/4	8 1/2	2 1/4	20 1/2	2—1 1/4	45.00

BALL AND SOCKET BRACKET HANGERS

UNIVERSAL GIANT—PATENTED RING OILING

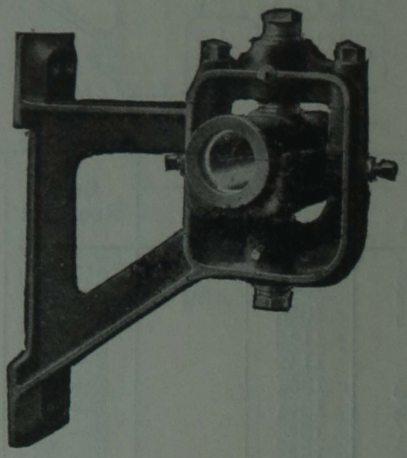


Fig. 1706

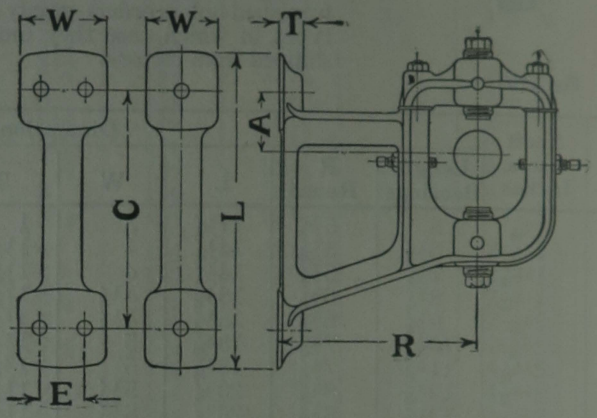


Fig. 1707

NO. T-329

Universal Giant Bracket Hangers embody the adjusting features described on a foregoing page.

They are designed to support shafting carrying large diameter pulleys in place of pillow block and wall bracket combination and are very desirable for use in maintaining a fixed distance from supports to shaft center where a line shaft is composed of different diameters, as all sizes are made with standard reaches.

Ring oiling bearings (**No. T-319**) are always furnished unless orders specify other types, in which case they must be shipped from the factory.

Frame Symbol	Shaft Sizes, Inches	Dimensions, Inches								Bolts Required	Each
		Length Bearings	R Reach	L	W	T	A	C	E		
B	1 7/16	6 1/8	10	16 13/16	4	1 1/8	2 1/2	12 7/8		2–1/2	$7.20
			12	18 1/16	4	1 1/8	2 1/2	14 1/8		2–1/2	7.60
			14	19 5/16	4	1 1/8	2 1/2	15 3/8		2–1/2	8.00
			16	20 9/16	4	1 1/8	2 1/2	16 5/8		2–1/2	8.40
			18	21 13/16	4	1 1/8	2 1/2	17 7/8		2–1/2	8.90
B	1 11/16	7 1/4	10	16 13/16	4	1 1/8	2 1/2	12 7/8		2–1/2	7.70
			12	18 1/16	4	1 1/8	2 1/2	14 1/8		2–1/2	8.10
			14	19 3/16	4	1 1/8	2 1/2	15 3/8		2–1/2	8.50
			16	20 9/16	4	1 1/8	2 1/2	16 5/8		2–1/2	8.90
			18	21 13/16	4	1 1/8	2 1/2	17 7/8		2–1/2	9.40
C	1 15/16	8 1/4	10	17 5/8	4 1/2	1 1/4	3	13 5/8		2–5/8	9.50
			12	18 1/4	4 1/2	1 1/4	3	14 1/4		2–5/8	10.00
			14	19 7/8	4 1/2	1 1/4	3	15 7/8		2–5/8	10.50
			16	21	4 1/2	1 1/4	3	17		2–5/8	11.00
			18	22 1/8	4 1/2	1 1/4	3	18 1/8		2–5/8	11.75
			20	23 1/4	5 1/4	1 1/4	3	19 1/4		2–3/4	12.50
			24	25 1/2	5 1/4	1 1/4	3	21 1/2		2–3/4	13.60

Balance of Price List on the Following Page

BALL AND SOCKET BRACKET HANGERS

UNIVERSAL GIANT—PATENTED RING OILING

NO. T-329

Frame Symbol	Shaft Sizes, Inches	Length Bearings, Inches	R Reach, Inches	Dimensions in Inches						Bolts Required	Each
				L	W	T	A	C	E		
C	2 3/16	9 1/4	10	17 5/8	4 1/2	1 1/4	3	13 5/8		2–5/8	$10.50
			12	18 1/4	4 1/2	1 1/4	3	14 1/4		2–5/8	11.00
			14	19 7/8	4 1/2	1 1/4	3	15 7/8		2–5/8	11.50
			16	21	4 1/2	1 1/4	3	17		2–5/8	12.00
			18	22 1/8	4 1/2	1 1/4	3	18 1/8		2–5/8	12.75
			20	23 1/4	5 1/4	1 1/4	3	19 1/4		2–3/4	13.50
			24	25 1/2	5 1/4	1 1/4	3	21 1/2		2–3/4	14.60
D	2 7/16	10 3/8	10	20 3/16	5	1 3/8	3 7/16	15 3/4		2–3/4	14.40
			12	21 1/16	5	1 3/8	3 7/16	16 5/8		2–3/4	15.00
			14	22 11/16	5	1 3/8	3 7/16	18 1/4		2–3/4	15.60
			16	24 3/16	5	1 3/8	3 7/16	19 3/4		2–3/4	16.30
			18	25 7/16	5	1 3/8	3 7/16	21		2–3/4	17.00
			20	26 11/16	6	1 3/8	3 7/16	22 1/4	2 1/4	4–5/8	17.90
			24	29 3/16	6	1 3/8	3 7/16	24 3/4	2 1/4	4–5/8	21.00
D	2 11/16	11 3/8	10	20 3/16	5	1 3/8	3 7/16	15 3/4		2–3/4	15.65
			12	21 1/16	5	1 3/8	3 7/16	16 5/8		2–3/4	16.25
			14	22 11/16	5	1 3/8	3 7/16	18 1/4		2–3/4	16.85
			16	24 3/16	5	1 3/8	3 7/16	19 3/4		2–3/4	17.55
			18	25 7/16	5	1 3/8	3 7/16	21		2–3/4	18.25
			20	26 11/16	6	1 3/8	3 7/16	22 1/4	2 1/4	4–5/8	19.15
			24	29 3/16	6	1 3/8	3 7/16	24 3/4	2 1/4	4–5/8	22.25
E	2 15/16	12 3/8	10	21 7/8	5 1/2	1 1/2	3 3/4	16 7/8		2–7/8	19.50
			12	23 1/2	5 1/2	1 1/2	3 3/4	18 1/2		2–7/8	20.25
			14	25 1/4	5 1/2	1 1/2	3 3/4	20 1/4		2–7/8	21.00
			16	26 3/4	5 1/2	1 1/2	3 3/4	21 3/4		2–7/8	22.00
			18	28 1/4	5 1/2	1 1/2	3 3/4	23 1/4		2–7/8	23.00
			20	29 3/4	6 1/2	1 1/2	3 3/4	24 3/4	2 3/8	4–3/4	24.00
			24	32 3/4	6 1/2	1 1/2	3 3/4	27 3/4	2 3/8	4–3/4	26.00
E	3 3/16	13 1/4	10	21 7/8	5 1/2	1 1/2	3 3/4	16 7/8		2–7/8	21.00
			12	23 1/2	5 1/2	1 1/2	3 3/4	18 1/2		2–7/8	21.75
			14	25 1/4	5 1/2	1 1/2	3 3/4	20 1/4		2–7/8	22.50
			16	26 3/4	5 1/2	1 1/2	3 3/4	21 3/4		2–7/8	23.50
			18	28 1/4	5 1/2	1 1/2	3 3/4	23 1/4		2–7/8	24.50
			20	29 3/4	6 1/2	1 1/2	3 3/4	24 3/4	2 3/8	4–3/4	25.50
			24	32 3/4	6 1/2	1 1/2	3 3/4	27 3/4	2 3/8	4–3/4	27.50
F	3 7/16	14 1/4	10	22 1/2	6	1 3/4	4 3/8	16 3/8	2 1/2	4–7/8	24.10
			12	24	6	1 3/4	4 3/8	17 7/8	2 1/2	4–7/8	28.00
			14	25 1/2	6	1 3/4	4 3/8	19 3/8	2 1/2	4–7/8	29.00
			16	27	6	1 3/4	4 3/8	20 7/8	2 1/2	4–7/8	30.50
			18	28 1/2	6	1 3/4	4 3/8	22 3/8	2 1/2	4–7/8	32.00
			20	30	7	1 3/4	4 3/8	23 7/8	2 1/2	4–7/8	34.00
			24	33	7	1 3/4	4 3/8	27 7/8	2 1/2	4–7/8	38.00
F	3 11/16	15 1/2	10	22 1/2	6	1 3/4	4 3/8	16 3/8	2 1/2	4–7/8	26.10
			12	24	6	1 3/4	4 3/8	17 7/8	2 1/2	4–7/8	30.00
			14	25 1/2	6	1 3/4	4 3/8	19 3/8	2 1/2	4–7/8	31.00
			16	27	6	1 3/4	4 3/8	20 7/8	2 1/2	4–7/8	32.50
			18	28 1/2	6	1 3/4	4 3/8	22 3/8	2 1/2	4–7/8	34.00
			20	30	7	1 3/4	4 3/8	23 7/8	2 1/2	4–7/8	36.00
			24	33	7	1 3/4	4 3/8	26 7/8	2 1/2	4–7/8	40.00
G	3 15/16	16 1/2	12	25 1/2	7	2	4 7/8	19	2 3/4	4–1	32.75
			14	26 3/4	7	2	4 7/8	20 1/4	2 3/4	4–1	37.00
			16	28	7	2	4 7/8	21 1/2	2 3/4	4–1	39.00
			18	29 1/4	7	2	4 7/8	22 3/4	2 3/4	4–1	41.00
			20	30 1/2	8	2	4 7/8	24	2 3/4	4–1	43.00
			24	33	8	2	4 7/8	26 1/2	2 3/4	4–1	46.00

BALL AND SOCKET HEAD SHAFT HANGERS

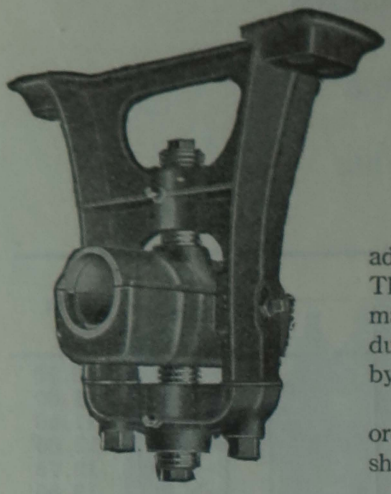


Fig. 1708

UNIVERSAL GIANT
PATENTED RING OILING

NO. T-330

Universal giant head shaft hangers embody the adjusting features as described on a foregoing page. They are designed to support head shafts carrying main driving pulleys and main line shafts where the duty is heavy. A substantial floor stand is obtainable by using this hanger with bearing inverted.

Ring oiling bearings are always furnished unless orders specify other types, in which case they must be shipped from the factory.

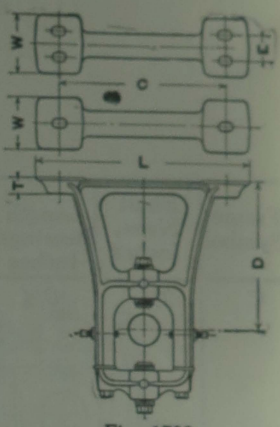


Fig. 1709

Frame Symbol	Shaft Sizes, Inches	Length Bearings, Inches	D, Drop, Inches	Dimensions in Inches					Bolts Required	Each
				L	W	T	C	E		
D	1 15/16	10 3/8	10—12	17 7/8	5 1/2	1 3/8	13 7/16		2— 3/4	$11.00
			13—15	19 1/8	6	1 3/8	14 11/16		2— 3/4	12.00
			16—18	20 3/8	6 1/2	1 3/8	15 7/8		2— 3/4	13.00
			19—21	21 5/8	6 3/4	1 3/8	17 1/8		2— 3/4	14.00
			23—25	26 5/8	7 1/2	1 1/2	22 1/8	3	4— 3/4	15.50
D	2 3/16	11 3/8	10—12	17 7/8	5 1/2	1 3/8	13 7/16		2— 3/4	12.25
			13—15	19 1/8	6	1 3/8	14 11/16		2— 3/4	13.25
			16—18	20 3/8	6 1/2	1 3/8	15 7/8		2— 3/4	14.25
			19—21	21 5/8	6 3/4	1 3/8	17 1/8		2— 3/4	15.25
			23—25	26 5/8	7 1/2	1 1/2	22 1/8	3	4— 3/4	16.75
E	2 7/16	12 3/8	10—12	19 9/16	6 3/8	1 1/2	14 3/4		2— 7/8	15.50
			13—15	20 7/8	6 3/4	1 1/2	15 7/8		2— 7/8	17.00
			16—18	22 1/16	7	1 1/2	17 1/8		2— 7/8	18.50
			19—21	23 1/4	7 1/2	1 1/2	18 3/8		2— 7/8	20.00
			23—25	28 5/16	8	1 5/8	23 3/8	3 1/4	4— 3/4	21.50
E	2 11/16	13 1/4	10—12	19 9/16	6 3/8	1 1/2	14 3/4		2— 7/8	17.00
			13—15	20 7/8	6 3/4	1 1/2	15 7/8		2— 7/8	18.50
			16—18	22 1/16	7	1 1/2	17 1/8		2— 7/8	20.00
			19—21	23 1/4	7 1/2	1 1/2	18 3/8		2— 7/8	21.50
			23—25	28 5/16	8	1 5/8	23 3/8	3 1/4	4— 3/4	23.00
F	2 15/16	14 1/4	10—12	21 1/2	6 1/2	1 3/4	16 1/4	3 1/4	4— 7/8	22.50
			13—15	22 1/2	7	1 3/4	17	3 1/4	4— 7/8	24.00
			16—18	23 1/2	7 1/2	1 3/4	18	3 1/4	4— 7/8	25.50
			19—21	24 1/2	8	1 3/4	19	3 1/4	4— 7/8	27.00
			23—25	29 1/2	8 1/2	1 3/4	24	4	4— 7/8	29.50
F	3 3/16	15 1/2	10—12	21 1/2	6 1/2	1 3/4	16 1/4	3 1/4	4— 7/8	24.50
			13—15	22 1/2	7	1 3/4	17	3 1/4	4— 7/8	26.00
			16—18	23 1/2	7 1/2	1 3/4	18	3 1/4	4— 7/8	27.50
			19—21	24 1/2	8	1 3/4	19	3 1/4	4— 7/8	29.00
			23—25	29 1/2	8 1/2	1 3/4	24	4	4— 7/8	31.50
G	3 7/16	16 1/2	10—12	23 1/2	7	2	17 1/2	3 1/4	4—1	29.00
			13—15	24 1/2	7 1/2	2	18 1/2	3 1/4	4—1	31.00
			16—18	25 1/2	8	2	19 1/2	3 1/4	4—1	33.00
			19—21	26 1/2	8 1/2	2	20 1/2	3 1/4	4—1	35.50
			23—25	30 1/4	9	2	24 1/4	4 1/2	4—1	38.50
G	3 11/16	17 1/2	10—12	23 1/2	7	2	17 1/2	3 1/4	4—1	31.00
			13—15	24 1/2	7 1/2	2	18 1/2	3 1/4	4—1	33.00
			16—18	25 1/2	8	2	19 1/2	3 1/4	4—1	35.00
			19—21	26 1/2	8 1/2	2	20 1/2	3 1/4	4—1	37.50
			23—25	30 1/4	9	2	24 1/4	4 1/2	4—1	40.50
H	3 15/16	18	10—12	26 3/4	8	2 1/4	20 1/2	3 1/2	4—1 1/8	40.00
			13—15	28 1/4	8 1/2	2 1/4	22 1/4	3 1/2	4—1 1/8	43.00
			16—18	30	9	2 1/4	23 3/4	3 1/2	4—1 1/8	46.00
			19—21	31 1/2	9 1/2	2 1/4	25 3/8	5	4—1 1/8	49.00
			23—25	33 3/4	10	2 1/4	27 1/2	5	4—1 1/8	54.00
H	4 7/16	20	10—12	26 3/4	8	2 1/4	20 1/2	3 1/2	4—1 1/8	45.00
			13—15	28 1/4	8 1/2	2 1/4	22 1/4	3 1/2	4—1 1/8	48.00
			16—18	30	9	2 1/4	23 3/4	3 1/2	4—1 1/8	51.00
			19—21	31 1/2	9 1/2	2 1/4	25 3/8	5	4—1 1/8	54.00
			23—25	33 3/4	10	2 1/4	27 1/2	5	4—1 1/8	59.00

EXTRA HEAVY BALL AND SOCKET HEAD SHAFT HANGERS

UNIVERSAL GIANT—PATENTED RING OILING

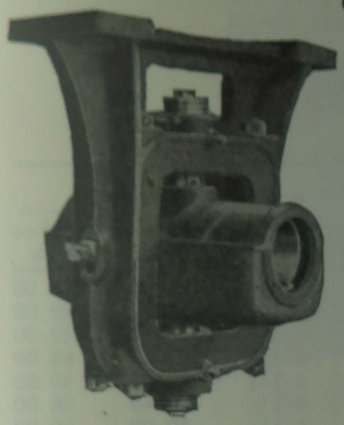


Fig. 1710

NO. T-332

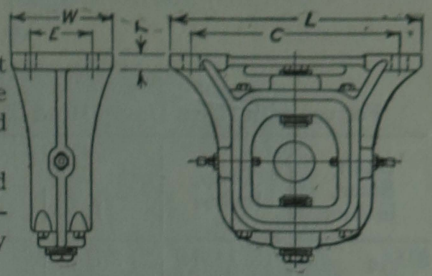


Fig. 1711

Designed especially for extra heavy headshaft service, this hanger is one of the best of its type and embodies the adjusting features described on a foregoing page.

The frame is exceptionally strong and of rigid construction. The yoke which carries the bearing is connected to the frame by four heavy through bolts.

The bearing is adjustable laterally and vertically within the frame, which insures accurate alignment of shafting and maintenance of same.

Base plates or shoes will be furnished when desired. The shoes, three inches thick, are used to obtain odd drops; a twelve-inch hanger and three-inch shoe give a drop of fifteen inches.

Shaft Sizes, Inches	Drop, Inches	Length Bearing, Inches	Dimensions in Inches					Bolts Required	Each
			L	W	C	E	T		
3 15/16	12	18 1/4	26	7 1/2	21 1/2	4	1 1/4	4—1	$77.00
	14		26	7 1/2	21 1/2	4	1 1/4	4—1	80.00
	16		26	7 1/2	21 1/2	4	1 1/4	4—1	83.50
	18		26	7 1/2	21 1/2	4	1 1/4	4—1	87.00
	20		32 1/2	7 1/2	28	4	1 1/4	4—1	93.00
	24		32 1/2	7 1/2	28	4	1 1/4	4—1	100.00
4 7/16	12	20 1/4	29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	90.00
	14		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	93.00
	16		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	96.50
	18		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	100.50
	20		36	8 1/2	31	4 3/4	1 3/8	4—1 1/8	105.00
	24		36	8 1/2	31	4 3/4	1 3/8	4—1 1/8	112.00
4 15/16	12	20	29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	94.50
	14		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	97.50
	16		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	101.00
	18		29	8 1/2	24	4 3/4	1 3/8	4—1 1/8	105.00
	20		36 1/2	8 1/2	31	4 3/4	1 3/8	4—1 1/8	109.50
	24		36 1/2	8 1/2	31	4 3/4	1 3/8	4—1 1/8	116.50
5 7/16	12	24	33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	120.00
	14		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	125.00
	16		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	130.00
	18		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	135.00
	20		40 1/2	9 1/2	35	5 1/2	1 1/2	4—1 1/4	140.00
	24		40 1/2	9 1/2	35	5 1/2	1 1/2	4—1 1/4	150.00
5 15/16	12	24	33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	127.00
	14		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	132.00
	16		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	137.00
	18		33	9 1/2	27 1/2	5 1/2	1 1/2	4—1 1/4	142.00
	20		40 1/2	9 1/2	35	5 1/2	1 1/2	4—1 1/4	147.00
	24		40 1/2	9 1/2	35	5 1/2	1 1/2	4—1 1/4	157.00
6 7/16	12	26	35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	165.00
	14		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	171.50
	16		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	178.00
	18		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	185.00
	20		43	10 1/2	37	6 1/2	1 3/4	4—1 3/8	191.50
	24		43	10 1/2	37	6 1/2	1 3/4	4—1 3/8	203.50
6 15/16	12	26	35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	176.00
	14		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	182.50
	16		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	189.00
	18		35	10 1/2	29	6 1/2	1 3/4	4—1 3/8	196.00
	20		43	10 1/2	37	6 1/2	1 3/4	4—1 3/8	202.50
	24		43	10 1/2	37	6 1/2	1 3/4	4—1 3/8	214.50
7 7/16	16		40	11 1/2	33 1/2	8 1/2	2	4—1 1/2	254.00
	18		40	11 1/2	33 1/2	8 1/2	2	4—1 1/2	262.00
	20		44	11 1/2	37 1/2	8 1/2	2	4—1 1/2	272.00
	24		44	11 1/2	37 1/2	8 1/2	2	4—1 1/2	286.00
7 15/16	16		40	11 1/2	33 1/2	8 1/2	2	4—1 1/2	274.00
	18		40	11 1/2	33 1/2	8 1/2	2	4—1 1/2	282.00
	20		44	11 1/2	37 1/2	8 1/2	2	4—1 1/2	292.00
	24		44	11 1/2	37 1/2	8 1/2	2	4—1 1/2	306.00

BASE PLATES AND SHOES

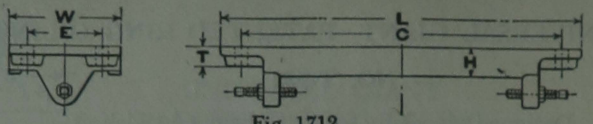


Fig. 1712

NO. T-333

For use with Extra Heavy Head Shaft Hangers.

Shaft Sizes, Inches	Drop, Inches	Dimensions in Inches						Bolts Required	Each	
		L	W	C	E	H	T		2 Inches Thick	3 Inches Thick
3 15/16	12–14–16	35½	8¾	32	5	Made in two thicknesses 2 inches and 3 inches. See price list, this table.	1¼	4–1	$25.00	$30.00
	18–20–24	42	8¾	38½	5		1¼	4–1	36.00	42.00
4 7/16–4 15/16	12–14–16	38½	9¾	34½	6		1⅜	4–1⅛	32.50	39.00
	18–20–24	45½	9¾	41½	6		1⅜	4–1⅛	45.50	54.60
5 7/16–5 15/16	12–14–16	43	11	39	7		1½	4–1¼	41.00	49.20
	18–20–24	50½	11	46½	7		1½	4–1¼	57.40	68.90
6 7/16–6 15/16	12–14–16	45	11½	41	7¾		1¾	4–1⅜	50.00	60.00
	18–20–24	53	11½	49	7¾		1¾	4–1⅜	70.00	84.00
7 7/16–7 10/16	12–14–16	52	13	47	8½		2	4–1½	61.00	72.00
	18–20–24	56	13	51	8½		2	4–1½	85.00	100.00

HANGER AND PILLOW BLOCK PARTS

UNIVERSAL GIANT

NO. T-331

The unique adjusting features of Universal Giant hangers and pillow blocks make them especially desirable for use with the various types of anti-friction bearings, which may be made with Universal Giant bosses to fit these frames.

In order that the proper size frame may be determined, the following table gives the necessary dimensions.

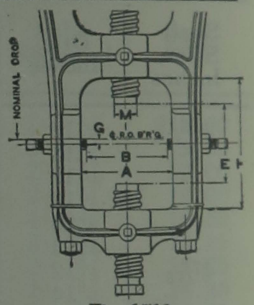


Fig. 1713

Housing Dimensions in Inches

Frame Symbol	A	B	E			H			G	M
			Drop Hanger	Post and Bracket Hanger	Adjustable Pillow Block	Drop Hanger	Post and Bracket Hanger	Adjustable Pillow Block		
A	3½	3	2⅝	2⅝	2⅝	4⅞	4⅛	4⅛	¼	11/16
B	4	3½	3¼	3¼	3¼	6	5	5	¼	1 3/16
C	4 11/16	4 3/16	3⅞	3⅞	3⅞	6⅝	5⅝	5⅝	¼	1 3/16
D	5½	5	4⅝	4⅝	4⅝	7½	6½	6½	⅜	1 11/16
E	6⅛	5⅝	5 3/16	5 3/16	5 3/16	8	7	7	7/16	1 11/16
F	7	6½	5¾	5¾	5¾	8⅝	7⅝	7⅝	7/16	2 3/16
G	7½	7	6 9/16	6 9/16	6 9/16	9½	8½	8½	½	2 3/16
H	8⅞	8⅜	7¾	7¾	7¾	10¾	9¾	9¾	⅝	2 11/16

Note.—Distance from shaft center to base of hangers, when ball or roller bearings are used, is equal to nominal drop plus dimension G.

PRICE LIST OF UNIVERSAL GIANT HANGER AND PILLOW BLOCK PARTS

Frame Symbol	Shaft Size, Inches	Babbitted Bearings, Each	R.O. Bearings For Head Shaft Hangers, Each	Drop Hanger Frames, Without Bearings — Drop, Inches							Post Hanger Frames Without Bearings, Each	Pillow Block Frames Without Bearings, Each
				7–9	10–12	13–15	16–18	19–21	23–25	28–30	34–36	
A	1 3/16	$1.75	.....	$2.85	$3.52	$3.65	$4.15	$4.65	.....	.....	.....	$3.25	$2.85
B	1 7/16	2.25	.....	2.95	3.35	3.95	4.45	5.15	$6.00	....	....	3.35	2.95
	1 11/16	2.75	.....										
C	1 15/16	3.25	$5.00	4.00	4.50	5.10	5.75	6.50	7.25	$10.25	....	4.00	3.75
	2 3/16	4.25	6.25										
D	2 7/16	5.00	7.50	5.20	6.00	7.00	8.00	9.00	10.50	13.50	$17.00	6.00	5.20
	2 11/16	6.25	9.00										
E	2 15/16	7.50	10.50	7.00	8.00	9.50	11.00	12.50	14.00	17.50	21.50	8.50	7.50
	3 3/16	9.00	12.50										
F	3 7/16	10.50	14.50	....	12.00	13.50	15.00	16.50	19.00	22.50	26.50	13.50	12.00
	3 11/16	12.50	16.50	....	14.50	16.50	18.50	21.00	24.00	27.50	32.50	7.50	14.00
G	3 15/16	14.50	18.50										
H	4 7/16	18.50	23.50		21.50	24.50	27.50	30.50	35.50	41.50	51.50	29.50	21.50
	4 15/16	23.50											

Note.—To obtain list prices of bracket hanger frames, deduct babbitted bearing prices in third column from list of complete bracket hangers.

BALL AND SOCKET PILLOW BLOCKS

RING OILING

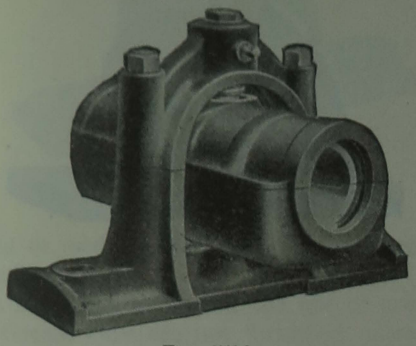


Fig. 1714

NO. T-342

A true ball and socket type pillow block. Made exceptionally strong and have bearings nearly five times longer than the diameter of the shaft. They are provided with ring oiling arrangement, the rings hanging loosely on shaft and dipping into the oil reservoir as the shaft revolves. This method furnishes a generous supply of oil to the bearings. Any surplus oil is wiped off at end of bearing by exclusive device and returned to oil reservoir. The reservoir is large and holds a big supply of oil.

Blocks can be furnished with bed plates which will permit lateral adjustment. Vertical adjustment is secured by plunger screws in base as shown in cut. All bearings are babbitted, accurately finished and faced off at the ends.

After the bearing has been adjusted to its correct position, the cylindrical surfaces allow it to roll between the ends of the vertical plungers without causing binding or straining of any kind upon the bearing or its supports. It is thus free to adjust itself automatically to any angularity of the shaft due to deflection or it is free to maintain its correct position on the shaft should the block base twist or turn.

Size Shaft, Inches	Length Bearing, Inches	Height, Floor to Center of Shaft, Inches	Length Base, Inches	Bolts Required	Each
1 3/16	5	2 7/8	10 3/8	2- 7/16	$4.20
1 7/16	7 1/2	3 7/16	12 3/8	2- 1/2	5.90
1 11/16	8 3/4	3 7/16	12 3/8	2- 1/2	6.40
1 15/16	10	4	13 3/4	2- 5/8	7.00
2 3/16	11	4	13 3/4	2- 5/8	7.75
2 7/16	12 1/2	4 1/2	16 3/4	2- 3/4	10.75
2 11/16	12 1/2	4 1/2	16 3/4	2- 3/4	11.75
2 15/16	15 1/4	5 1/4	18 1/4	2- 7/8	15.75
3 3/16	15 1/4	5 1/4	18 1/4	2- 7/8	17.00
3 7/16	17 1/2	6	21 1/4	2-1	23.00
3 11/16	17 1/2	6	21 1/4	2-1	24.50
3 15/16	19	6 3/4	24	2-1 1/8	32.50
4 7/16	22	7 7/8	25 1/2	2-1 1/4	46.00
4 15/16	22	7 7/8	25 1/2	2-1 1/4	49.00
5 7/16	24	9 1/2	31	2-1 1/2	64.00
5 15/16	24	9 1/2	31	2-1 1/2	69.00
6 7/16	26	11	34 1/2	2-1 3/4	90.00
6 15/16	26	11	34 1/2	2-1 3/4	96.00
7 7/16	28	12 1/2	39	2-2	126.00
7 15/16	28	12 1/2	39	2-2	133.00

RIGID PILLOW BLOCKS

EXTRA HEAVY—RING OILING

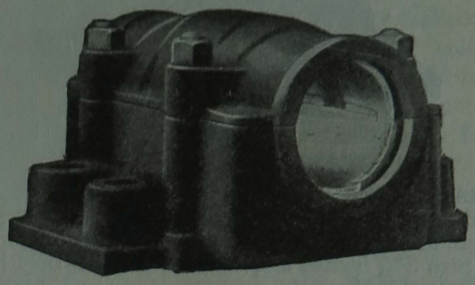


Fig. 1715

NO. T-347

Made of three-piece construction which consists of the base, bottom half of bearing and the cap. Especially designed to support heavy main line and jack shafts. Has ring oiling features. Bearing is always plentifully supplied with oil and any excess is wiped off at end of bearing and returned to reservoir. A ball and socket movement is possible by reason of the fact that the underside of bottom half of bearing fits into the concave surface in center of base. The bearing will adjust itself to shaft alignment. When the cap bolts are tightened it becomes rigid. Bottom half of bearing may be removed without disturbing shaft and bearing alignment, an important advantage when re-babbitting. Bearings can be made dust-proof at small increase in price.

Furnished babbitted, accurately finished to size with ends faced and bases machined. 3 3/16-inch and smaller have two slotted bolt holes in base; 3 7/16-inch and larger are provided with four.

Size Shaft, Inches	Length Bearing, Inches	Height, Floor to Center of Shaft, Inches	Length Base, Inches	Bolts Required	Each
2 7/16	9 1/4	3 1/8	11 1/2	2- 3/4	$10.90
2 11/16	9 1/4	3 1/8	11 1/2	2- 3/4	13.35
2 15/16	11	3 3/4	13	2- 7/8	16.50
3 3/16	11	3 3/4	13	2- 7/8	20.00
3 7/16	12 3/4	4 1/4	14	4- 3/4	24.50
3 11/16	12 3/4	4 1/4	14	4- 3/4	30.00
3 15/16	14 1/2	4 7/8	15 1/2	4- 7/8	35.60
4 7/16	16 1/2	5 3/8	17 3/4	4- 1	46.65
4 15/16	16	5 3/8	17 3/4	4- 1	60.00
5 7/16	19	6 3/4	20 1/2	4-1 1/8	73.50
5 15/16	19	6 3/4	20 1/2	4-1 1/8	89.00
6 7/16	22	7 7/8	22 3/4	4-1 1/8	104.50
6 15/16	22	7 7/8	22 3/4	4-1 1/8	120.00
7 7/16	25	8 3/8	25	4-1 1/4	135.50
7 15/16	25	8 3/8	25	4-1 1/4	150.00
8 7/16	21	10 1/4	31	4-1 3/8	170.00
8 15/16	21	10 1/4	31	4-1 3/8	180.00
9 7/16	24	11 5/8	34	4-1 1/2	200.00
9 15/16	24	11 5/8	34	4-1 1/2	215.00
10 7/16	24	12	36	4-1 5/8	245.00
10 15/16	24	12	36	4-1 5/8	265.00
11 7/16	24	12 1/2	37	4-1 3/4	300.00
11 15/16	24	12 1/2	37	4-1 3/4	320.00

RIGID PILLOW BLOCKS

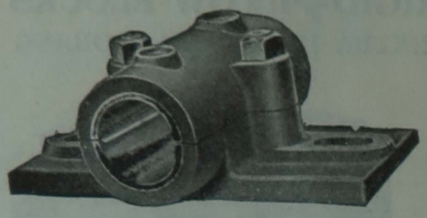


Fig. 1716

STANDARD—NO. T-350

Substantially constructed; accurately finished to size and ends faced; long babbitted bearings; slotted holes in base give lateral adjustment; oil holes tapped for grease cups. Size 3 3/16 inches and smaller have 2 bolt holes in base, larger sizes have 4.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	Height, Floor to Center of Shaft, Inches	Bolts Required	Each
1 3/16	3 3/4	7 1/4	1 1/4	2- 7/16	$1.60
1 7/16	4 1/2	8	1 1/2	2- 1/2	2.00
1 11/16	5 1/4	8 1/2	1 5/8	2—1/2	2.60
1 15/16	6	10	1 11/16	2- 5/8	3.60
2 3/16	6 3/4	10	1 7/8	2- 5/8	4.70
2 7/16	7 1/2	11 1/4	2 1/8	2- 3/4	5.50
2 11/16	8 1/4	11 3/4	2 1/4	2- 3/4	7.00
2 15/16	9	12 1/2	2 1/2	2- 7/8	8.75
3 3/16	9 3/4	13	2 3/4	2- 7/8	11.00
3 7/16	10 1/2	13 3/4	3	4- 3/4	13.00
3 11/16	11 1/4	14	3 1/8	4- 3/4	14.50
3 15/16	12	15 1/4	3 1/4	4- 7/8	16.00
4 7/16	13 1/2	17 3/4	3 5/8	4-1	21.00
4 15/16	15	17 3/4	4 1/8	4-1	27.50
5 7/16	16 1/2	20 1/2	4 1/2	4-1 1/8	34.00
5 15/16	18	20 1/2	5	4-1 1/8	42.00
6 7/16	19 1/2	22 3/4	5 3/8	4-1 1/8	50.00
6 15/16	21	22 3/4	5 3/4	4-1 1/8	60.00
7 7/16	22 1/2	25	6 1/4	4-1 1/4	70.00
7 15/16	24	25	6 3/4	4-1 1/4	80.00

Grease cup furnished at extra cost when specified.

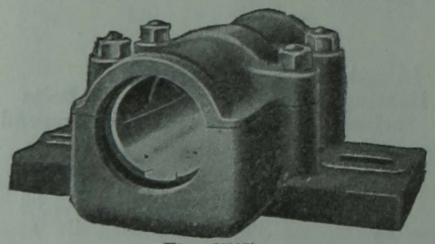


Fig. 1717

RING OILING—NO. T-348

Similar in construction to extra heavy pillow blocks, but lighter. Lines cannot be removed with shaft in place.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	Height, Floor to Center of Shaft, Inches	Bolts Required	Each
1 3/16	5	7 3/4	1 5/8	2- 3/8	$4.00
1 7/16	6	8	2	2- 1/2	4.75
1 11/16	7	8 1/2	2 1/16	2- 1/2	5.40
1 15/16	8	9	2 1/4	2- 5/8	6.00
2 3/16	9	9 1/2	2 3/8	2- 5/8	7.00
2 7/16	10	11	2 3/4	2- 3/4	8.25
2 11/16	11	11 1/2	2 7/8	2- 3/4	9.75
2 15/16	12	12 1/2	3 1/16	2- 7/8	12.00
3 3/16	13	13	3 1/4	2- 7/8	13.50
3 7/16	14	13 1/2	3 3/8	4- 3/4	16.50
3 11/16	15	14	3 1/2	4- 3/4	19.00
3 15/16	16	14 1/2	3 7/8	4- 7/8	23.00
4 7/16	18	16 3/4	4 5/8	4-1	30.00
4 15/16	20	17 3/4	4 3/4	4-1	40.00

RIGID ANGLE PILLOW BLOCKS

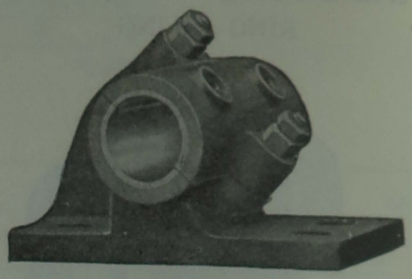


Fig. 1718

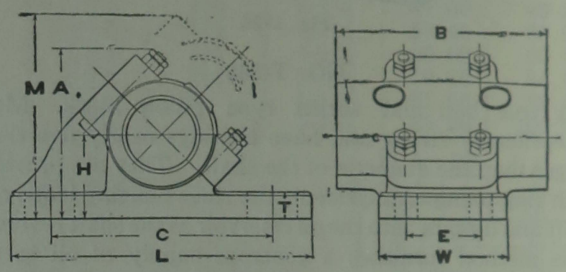


Fig. 1719

NO. T-639

These pillow blocks have been designed primarily to support shafts on which pull is exerted at an angle to the perpendicular, such as head and tail shafts in conveyor systems.

They may be used horizontally, vertically, or at any angle desired to meet existing conditions.

The long babbitt lined bearings have ends faced for collars and bases finished. Holes are tapped into caps for fitting oil or grease cups. Grease cups will be furnished at extra charge when specified.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	Height, Floor to Center of Shaft, Inches	Bolts Required	Each
1 3/16	3 3/4	7 1/4	1 7/8	4- 3/8	$2.40
1 7/16	4 1/2	8	2 1/8	4- 3/8	3.00
1 11/16	5 1/4	8 1/2	2 3/8	4- 3/8	3.90
1 15/16	6	10	2 3/4	4- 1/2	5.40
2 3/16	6 3/4	10	2 7/8	4- 1/2	7.05
2 7/16	7 1/2	11 1/4	3 1/4	4- 5/8	8.25
2 11/16	8 1/4	11 3/4	3 3/8	4- 5/8	10.50
2 15/16	9	12 1/2	3 1/2	4- 3/4	13.10
3 3/16	9 3/4	13	3 3/4	4- 3/4	16.50
3 7/16	10 1/2	13 3/4	4	4- 3/4	19.50
3 11/16	11 1/4	14	4 1/8	4- 3/4	21.75
3 15/16	12	15 1/4	4 1/2	4- 7/8	24.00
4 7/16	13 1/2	17 3/4	5	4-1	31.50
4 15/16	15	17 3/4	5 1/2	4-1	41.25
5 7/16	16 1/2	20 1/2	6	4-1 1/8	51.00
5 15/16	18	20 1/2	6 1/2	4-1 1/8	63.00
6 7/16	19 1/2	22 3/4	7	4-1 1/8	75.00
6 15/16	21	22 3/4	7 1/2	4-1 1/8	90.00
7 7/16	22 1/2	25	8	4-1 1/4	105.00
7 15/16	24	25	8 1/2	4-1 1/4	120.00

PLAIN FLAT BOXES

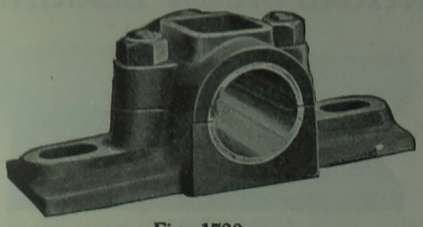


Fig. 1720

NO. T-352

For light or medium service or for use when space on shafting is limited.

Oil cap is tapped to permit the use of grease cup if desired. Grease cups are not furnished unless specified in order and are not included in price.

Bearings are babbitted. Slotted holes in base provide for lateral adjustment.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	*Floor to Center of Shaft, Inches	Bolts Required	Each
1 5/16	2	6	1 1/8	2– 3/8	$1.00
1 3/16	2 1/2	7 1/4	1 1/4	2– 7/16	1.25
1 7/16	3	8	1 3/8	2– 1/2	1.60
1 11/16	3 1/2	8 1/2	1 1/2	2– 1/2	2.00
1 15/16	4	9 1/2	1 3/4	2– 5/8	2.35
2 3/16	4 1/2	9 3/4	1 7/8	2– 5/8	2.80
2 7/16	5	11 1/8	2	2– 3/4	3.35
2 11/16	5 1/2	11 3/4	2 1/4	2– 3/4	4.00
2 15/16	6	12 1/2	2 3/8	2– 7/8	5.00
3 3/16	6 1/2	13	2 1/2	2– 7/8	6.25
3 7/16	7	14	2 3/4	2–1	7.75
3 11/16	7 1/2	14 1/2	2 7/8	2–1	9.50
3 15/16	8	16	3 1/8	2–1	11.75

*Height to center of shaft given is approximate.

SOLID JOURNAL BOXES

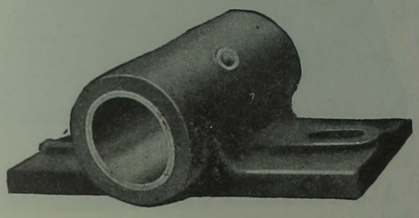


Fig. 1721

Fitted with Bennet Oilers set at an angle of 45 degrees, which permits bearing being used either as a pillow block or post box. Slotted holes in bases provide lateral adjustment. With plain bored or babbitt lined bearings.

Size Shaft, Inches	Length Base, Inches	Length Bearing, Inches	Bolts Required	NO. T-353 Plain Bored, Each	NO. T-354 Babbitt Lined, Each
1 5/16	4 1/2	2	2–3/8	$0.80	$0.90
1 3/16	5 1/4	2 1/2	2–3/8	1.00	1.15
1 7/16	6 3/8	3	2–1/2	1.30	1.45
1 11/16	7	3 1/2	2–1/2	1.60	1.80
1 15/16	7 3/4	4	2–5/8	1.90	2.10
2 3/16	8	4 1/2	2–5/8	2.50	2.50
2 7/16	8 3/4	5	2–3/4	3.10	3.10
2 11/16	9 1/4	5 1/2	2–3/4	3.65	3.65
2 15/16	10 1/2	6	2–7/8	4.75	4.75
3 3/16	11 1/2	6 1/2	2–7/8	6.00	6.00
3 7/16	12	7	2–7/8	7.50	7.50
3 11/16	12 1/2	7 1/2	2–7/8	9.00	9.00
3 15/16	13	8	2–7/8	10.75	10.75

RIGID POST BOXES

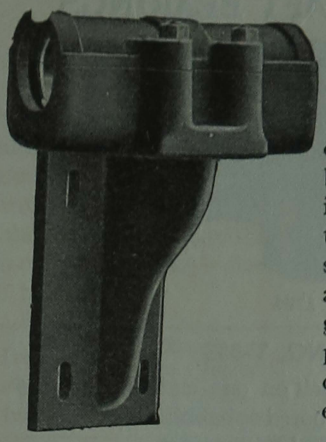


Fig. 1722

NO. T-355

RING OILING

Accurately finished to size, ends faced for collars and backs finished. Slotted holes in back of frame permit vertical adjustment. Tempered spring steel rings are used and the oil reservoir is of generous capacity. Dustproof bearings of this type can be furnished at slight extra cost.

Size Shaft, Inches	Length Bearing, Inches	Length Frame, Inches	*Post to Center of Shaft, Inches	Bolts Required	Each
1 7/16	6 1/4	7 1/4	3 1/2	4– 1/2	$4.90
1 11/16	7 1/2	7 1/2	3 1/2	4– 1/2	5.20
1 15/16	8 3/8	9	4	4– 5/8	7.20
2 3/16	9 7/16	9	4	4– 5/8	8.50
2 7/16	10 7/16	10 1/4	4 1/2	4– 3/4	11.50
2 11/16	11 1/2	10 1/4	4 1/2	4– 3/4	14.25
2 15/16	12 3/8	11	5	4– 3/4	18.25
3 3/16	13 3/8	11	5	4– 3/4	20.50
3 7/16	14 1/2	11 5/8	5 1/4	4– 7/8	23.50
3 11/16	15 1/2	11 5/8	5 1/4	4– 7/8	26.75
3 15/16	16 1/2	12 1/8	6	4–1	33.00
4 7/16	18 3/8	13 1/2	6 1/2	4–1 1/8	42.50
4 15/16	20 9/16	13 1/2	6 1/2	4–1 1/8	54.00

NO. T-356

STANDARD

Plain babbitt lined rigid bearings. Oil holes in cap are tapped to permit the use of grease cups if desired. Vertical adjustment is provided for by the slotted holes in back of frame.

Grease cups are furnished at an extra cost only when specified.

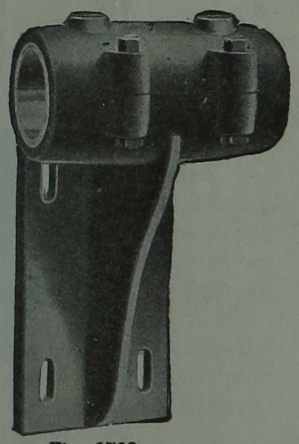


Fig. 1723

Size Shaft, Inches	Length Bearings, Inches	Length Frame, Inches	*Post to Center of Shaft, Inches	Bolts Required	Each
1 3/16	3 3/4	5 7/8	2 1/2	4– 3/8	$3.30
1 7/16	4 1/2	7 1/4	3 1/2	4– 1/2	3.70
1 11/16	5 1/4	7 1/4	3 1/2	4– 1/2	4.00
1 15/16	6	9	4	4– 5/8	5.70
2 3/16	6 3/4	9	4	4– 5/8	6.75
2 7/16	7 1/2	10 1/4	4 1/2	4– 3/4	8.25
2 11/16	8 1/4	10 1/4	4 1/2	4– 3/4	9.00
2 15/16	9	11	5	4– 3/4	10.50
3 3/16	9 3/4	11	5	4– 3/4	12.50
3 7/16	10 1/2	11 5/8	5 1/4	4– 7/8	14.75
3 11/16	11 1/4	11 5/8	5 1/4	4—7/8	17.50
3 15/16	12	12 1/8	6	4–1	22.00
4 7/16	13 1/2	13 1/2	6 1/2	4–1 1/8	31.00
4 15/16	15	13 1/2	6 1/2	4–1 1/8	42.00

*Dimension of post to center of shaft given is approximate.

VERTICAL SHAFT BEARINGS

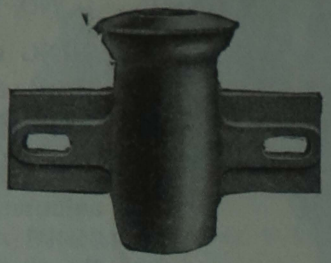


Fig. 1724

SOLID—NO. T-338

Made by casting an oil shell on one end of solid journals. Furnished either plain bored or babbitt lined. Slotted holes in base provide for lateral adjustment.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	NO. T-338 Plain Bored, Each	NO. T-338A Babbitt Lined, Each
15/16	2¼	4½	$1.20	$1.35
1 3/16	2¾	5¼	1.50	1.75
1 7/16	3¼	6⅜	1.95	2.20
1 11/16	3¾	7	2.40	2.70
1 15/16	4¼	7¾	3.15	3.15
2 3/16	4¾	8	3.75	3.75
2 7/16	5¼	8¾	4.65	4.65
2 11/16	5¾	9¼	5.50	5.50
2 15/16	6¼	10½	7.15	7.15
3 3/16	6¾	11½	9.00	9.00
3 7/16	7¼	12	11.25	11.25
3 11/16	7¾	12½	13.50	13.50
3 15/16	8¼	13	16.15	16.15

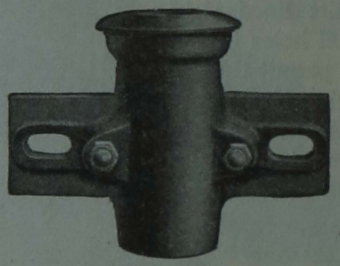


Fig. 1725

SPLIT—NO. T-339

Made by casting an oil shell on one end of standard rigid pillow blocks. Long babbitted bearings. Slotted holes in base provide for lateral adjustment.

Size Shaft, Inches	Length Bearing, Inches	Length Base, Inches	Bolts Required	Each
1 3/16	7½	7½	2-7/16	$2.40
1 7/16	8¼	8¼	2-½	3.00
1 11/16	8¾	8¾	2-½	3.90
1 15/16	10¼	10¼	2-⅝	5.40
2 3/16	10¼	10¼	2-⅝	7.00
2 7/16	11½	11½	2-¾	8.25
2 11/16	12	12	2-¾	10.50
2 15/16	12¾	12¾	2-⅞	13.15
3 3/16	13¼	13¼	2-⅞	16.50
3 7/16	13¾	13¾	4-¾	19.50
3 11/16	14¼	14¼	4-¾	21.75
3 15/16	15½	15½	4-⅞	24.00

VERTICAL SHAFT BEARINGS

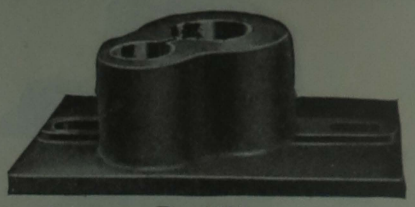


Fig. 1726

RIGID STEP—NO. T-340

Cast iron accurately finished to shaft sizes. Made with pocket for packing with oil and waste. Hardened steel disc fitted in bottom of bore. Slotted holes in base provide for lateral adjustment.

Size Shaft, Inches	Length Base, Inches	Width Base, Inches	Height Over All, Inches	Bolts Required	Each
15/16	8	4	2¾	2-½	$2.00
1 3/16	8	4	2¾	2-½	2.50
1 7/16	9⅜	5	2⅞	2-½	3.00
1 11/16	9⅜	5	2⅞	2-⅝	3.50
1 15/16	9⅜	5	2⅞	2-⅝	4.50
2 3/16	9⅜	5	2⅞	2-⅝	5.50
2 7/16	10	6	3 3/16	2-¾	6.50
2 11/16	10	6	3 3/16	2-¾	8.00
2 15/16	10	6	3 3/16	2-¾	10.00
3 3/16	10	6	3 3/16	2-¾	11.50
3 7/16	12½	7⅞	4⅜	2-⅞	13.00
3 11/16	12½	7⅞	4⅜	2-⅞	15.00
3 15/16	12½	7⅞	4⅜	2-⅞	18.00

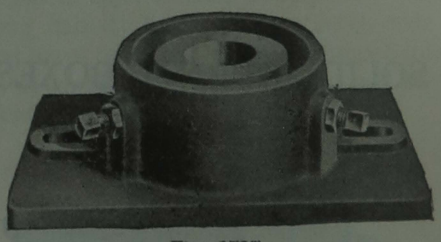


Fig. 1727

ADJUSTABLE STEP—NO. T-341

Made of cast iron accurately finished to shaft sizes. Fitted with hardened steel disc in bottom of bore. The step proper is free to adjust in any direction, being held in place by set screws. Space between step and outer shell provides for lubrication. Further adjustment is obtained by the slotted holes in base.

Size Shaft, Inches	Length Base, Inches	Width Base, Inches	Height Over All, Inches	Bolts Required	Each
15/16	7	4	2¾	2-½	$4.00
1 3/16	7	4	2¾	2-½	5.00
1 7/16	9⅞	5½	2¾	2-⅝	6.00
1 11/16	9⅞	5½	2¾	2-⅝	7.00
1 15/16	9⅞	5½	2¾	2-⅝	9.20
2 3/16	9⅞	5½	2¾	2-⅝	11.00
2 7/16	14	8½	4½	2-¾	13.00
2 11/16	14	8½	4½	2-¾	16.00
2 15/16	14	8½	4½	2-¾	20.00
3 3/16	14	8½	4½	2-¾	22.80
3 7/16	17	10	5¾	2-⅞	26.20
3 11/16	17	10	5¾	2-⅞	29.90
3 15/16	17	10	5¾	2-⅞	36.00

CAST IRON QUILLS

NO. T-344

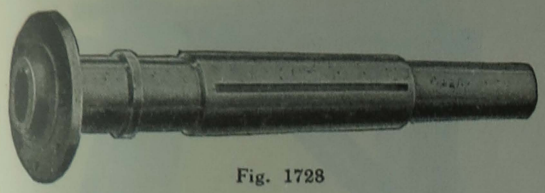


Fig. 1728

Primarily used for heavy installations, taking the place of clutch sleeves or other loose members running on shaft. Quills are supported by independent bearings which relieve the shaft of all bending stresses resulting from weight of wheels and pull of belts or ropes, thus overcoming frictional losses due to deflection of shaft when pulleys, sheaves or clutches are mounted directly on shaft.

As quills do not come in contact with shaft, they require no lubrication other than that necessary for bearings in which they operate. They cannot, like a loose sleeve which revolves on shaft, or like a stationary sleeve with the shafting revolving inside, become seized to shaft on account of improper lubrication.

Size Shaft, Inches	Outside Diameter at Bearing, Inches	Length Bearing, Inches	Bearing to Boss, Inches	Diameter at Boss, Inches	Bearing to Clutch Flange, Inches	Keyseat in Boss, Inches	Per Foot
2 15/16	5 11/16	12	3/4	6 11/16	1 3/4	1 1/4 x 1/4	$24.40
3 7/16	6 3/16	14	3/4	7 3/16	1 3/4	1 1/2 x 1/4	29.40
3 15/16	6 11/16	14	3/4	7 11/16	2	1 3/4 x 1/4	31.80
4 7/16	7 7/16	16	3/4	8 7/16	2	1 3/4 x 1/4	35.00
4 15/16	8 3/16	16	3/4	9 3/16	2	2 x 3/8	38.00
5 7/16	8 11/16	18	3/4	9 11/16	2 1/4	2 x 3/8	41.00
5 15/16	9 3/16	18	3/4	10 3/16	2 1/4	2 1/4 x 3/8	42.00
6 7/16	10 3/16	21	3/4	11 3/16	2 1/2	2 1/2 x 3/8	44.00
6 15/16	10 11/16	21	3/4	11 11/16	2 1/2	2 3/4 x 3/8	50.00
7 7/16	11 11/16	24	3/4	12 11/16	2 3/4	3 x 3/8	60.00
7 15/16	12 3/16	24	3/4	13 3/16	2 3/4	3 x 3/8	64.00

Length of boss should not be less than width of pulley face.
Prices on steel quills quoted on application.

RIGID QUILL BEARINGS

RING OILING—NO. T-345

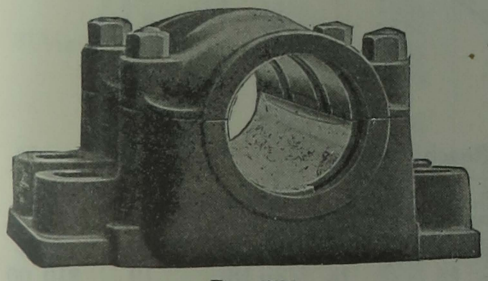


Fig. 1729

Commonly known as the three-piece type, composed of a base, liner or bottom half of bearing proper and a cap. They are babbitted, finished accurately to size, ends faced for collars and bases machined.

A spherical or convex surface on underside of liner in center of bearing fits a mating or concave surface in center of base. This allows a ball and socket movement between the two parts, permitting the liner to adjust itself to quill alignment, after which it is made rigid by tightening cap bolts.

In this bearing the liner may be removed from its position by revolving it around the quill after cap has been removed and weight of quill sustained by outside support. This is of great advantage when it becomes necessary to re-babbitt as the alignment of both bearing and quill are undisturbed.

As very accurate alignment is essential in erecting and operating quill equipments, it is advisable to use quill bearings only in connection with wedge adjusting, base plates, floor stands or sling hangers, for the reason that necessary movement can be easily accomplished to keep quill concentric with shaft.

Size Shaft, Inches	Size Quill, Inches	Height to Center of Shaft, Inches	Length Bearing, Inches	Length Back, Inches	Width Base, Inches	Thickness, Inches	Height Over all, Inches	Necessary Clearance, Inches	Center to Center of Bolt Holes, Inches		Bolts Required	Each
									Length	Width		
2 15/16	5 11/16	6 3/8	12	20 1/2	6	4 1/2	11	14	16 3/4		2—1	$75.00
3 7/16	6 3/16	7 3/8	14	22 3/4	8	5	12 3/4	16	18 3/4	4 7/8	4—1	85.00
3 15/16	6 11/16	7 3/8	14	22 3/4	8	5	12 3/4	16	18 3/4	4 7/8	4—1	95.00
4 7/16	7 7/16	7 3/4	16	25	9	6	14	18	20 1/2	5 1/8	4—1 1/8	120.00
4 15/16	8 3/16	7 3/4	16	25	9	6	14	18	20 1/2	5 1/8	4—1 1/8	130.00
5 7/16	8 11/16	8 7/8	18	27 1/2	9 1/2	6 1/2	15 3/4	20	22 1/2	6	4—1 1/8	155.00
5 15/16	9 3/16	8 7/8	18	27 1/2	9 1/2	6 1/2	15 3/4	20	22 1/2	6	4—1 1/8	165.00
6 7/16	10 3/16	10 1/4	21	31	10 1/2	7	18	23	25 3/4	7	4—1 1/4	200.00
6 15/16	10 11/16	10 1/4	21	31	10 1/2	7	18	23	25 3/4	7	4—1 1/4	215.00
7 7/16	11 11/16	11 5/8	24	34	12	7 1/2	20 1/4	26	28 1/4	8	4—1 1/4	250.00
7 15/16	12 3/16	11 5/8	24	34	12	7 1/2	20 1/4	26	28 1/4	8	4—1 1/4	270.00

GIRDER CLAMPS

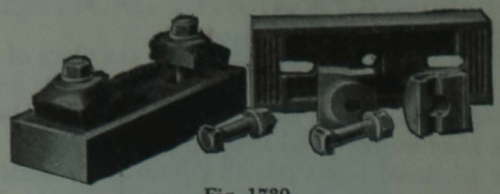


Fig. 1730

ADJUSTABLE—NO. T-336

For attaching hangers to iron beams or girders. Simple in construction, strong and easily attached. So designed that each one can be attached to several different sizes of girders. Each clamp is 2 inches thick, a fact that should be borne in mind when specifying drop of hangers.

FOR GIRDER FLANGES 3½ to 5 INCHES WIDE

NOS.	For Shaft Sizes, Inches	For Drops, Inches	Bolts Required*	Per Pair
1	1 7/16–2 3/16	0–21	2–½x2½	$5.50
2	1 7/16–2 3/16	23–36	4–½x2½	6.50
3	2 7/16–2 11/16	0–21	2–⅝x3	6.00
6	2 7/16–2 11/16	23–36	4–⅝x3	9.50
5	2 15/16–3 3/16	0–21	2–⅝x3	6.50
6	2 15/16–3 3/16	23–36	4–⅝x3	9.50
7	3 7/16–3 11/16	0–36	4–¾x3¼	12.00
8	3 15/16–4 3/16	0–36	4–¾x3¼	13.00
9	4 9/16–4 15/16	0–36	4–⅞x3¾	16.00

FOR GIRDER FLANGES 5 1/16 to 6 1/16 INCHES WIDE

NOS.	For Shaft Sizes, Inches	For Drops, Inches	Bolts Required*	Per Pair
21	1 7/16–2 3/16	0–21	2–½x2½	$6.50
22	1 7/16–2 3/16	23–36	4–½x2½	7.50
23	2 7/16–2 11/16	0–21	2–⅝x3	7.00
26	2 7/16–2 11/16	23–36	4–⅝x3	11.00
25	2 15/16–3 3/16	0–21	2–⅝x3	8.00
26	2 15/16–3 3/16	23–36	4–⅝x3	11.00
27	3 7/16–3 11/16	0–36	4–¾x3¼	13.50
28	3 15/16–4 3/16	0–36	4–¾x3¼	14.50
29	4 7/16–4 15/16	0–36	4–⅞x3¾	18.00

FOR GIRDER FLANGES 6 9/16 to 8 INCHES WIDE

NOS.	For Shaft Sizes, Inches	For Drops, Inches	Bolts Required*	Per Pair
31	1 7/16–2 3/16	0–21	2–½x2½	$8.00
32	1 7/16–2 3/16	23–36	4–½x2½	9.00
33	2 7/16–2 11/16	0–21	2–⅝x3	8.50
36	2 7/16–2 11/16	23–36	4–⅝x3	13.00
35	2 15/16–3 3/16	0–21	2–⅝x3	10.00
36	2 15/16–3 3/16	23–36	4–¾x3¼	13.00
37	3 7/16–3 11/16	0–36	4–¾x3¼	15.50
38	3 15/16–4 3/16	0–36	4–¾x3¼	17.00
39	4 7/16–4 15/16	0–36	4–⅞x3¾	21.00

*Bolts for fastening the clamps to the girder as specified are included in the price of the clamps, but bolts for attaching the hangers to the clamps are not furnished.

Fig. 1731

SOLID—NO. T-337

Each clamp is made to suit a particular width of flange. Two through bolts hold the clamp positively in place.

Per Pair

NO. 10—For Beam or Girder Flanges up to and including 4½ Inches Wide and for Hangers for Shaft, 2 15/16 Inch Diameter and Under $5.50

NO. 11—For Beam or Girder Flanges, above 4½ Inches and not over 8 Inches Wide and for Hangers for Shaft, 3 Inches to 3 15/16 Inches Diameter 6.50

WALL BRACKETS

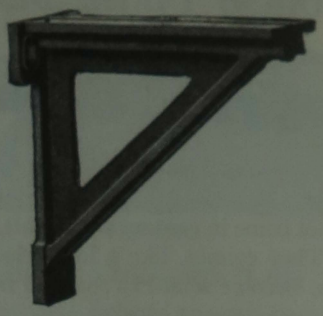


Fig. 1732

NO. T-357

Cast iron of extra strong construction. Designed to support pillow blocks carrying line shafting along a wall. Ample provision is provided for both vertical and lateral adjustment.

Pillow block D with two bolt holes in the base are attached by bolts fitted in slot which runs the full length of top of bracket. When pillow blocks have four bolt holes in base, four stud bolts are tapped into top of bracket to suit.

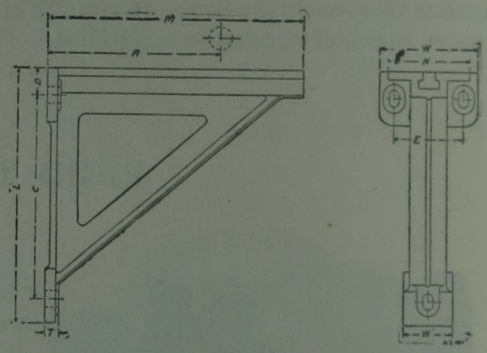


Fig. 1733

For Shaft Sizes, Inches	Reach, Inches* Adjustable Pillow Blocks	Rigid Pillow Blocks	Height Frame, Inches	Length Top, Inches	Each
1 7/16 to 2 3/16	12	14	18	19	$10.00
	18	20	24	25	13.35
	24	26	27	31	16.70
	30	32	33	37	20.00
	36	38	36	43	24.40
2 7/16 to 3 3/16	12	14	18	21	17.80
	18	20	24	27	22.20
	24	26	27	33	27.80
	30	32	33	39	34.50
	36	38	36	45	40.00
3 7/16 to 3 15/16	12	16	20	24	25.00
	18	22	26	30	32.00
	24	28	29	36	37.80
	30	34	35	42	45.00
	36	40	38	48	54.00
4 7/16 to 4 15/16	18	22	28	32	37.40
	24	28	31	38	46.20
	30	34	37	44	57.00
	36	40	40	50	66.00

*Reach as given applies to the use of the largest size pillow block for which bracket is designed. When using smaller pillow blocks the reach will equal the length of the top of bracket minus one-half the length of base of the pillow block used. Reach is to the center of the shaft.

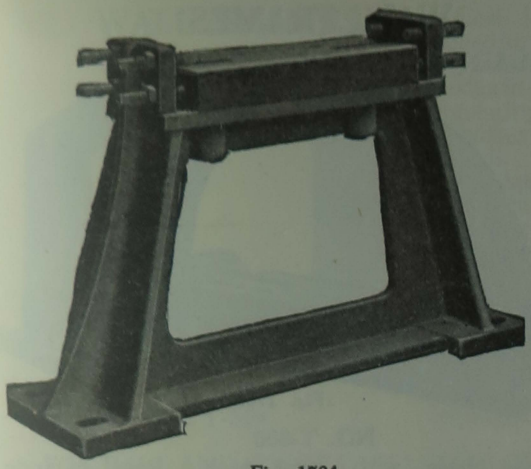


Fig. 1734

FLOOR STANDS

PLAIN AND WEDGE ADJUSTING

NO. T-358

For use with pillow block in supporting line shafting.

Made either plain or wedge adjusting of extra heavy design.

Plain floor stands do not have wedges and are intended for use with adjustable pillow blocks.

Adjustable floor stands are equipped with wedges to provide vertical adjustment and are intended for use with ball and socket or rigid pillow blocks.

The top of frame, also both sides of wedges, are accurately planed. These frames have either two or four bolt holes in top plate as may be required by pillow blocks which are to be fitted.

The height varies with the style of pillow block used.

FOR BALL AND SOCKET PILLOW BLOCKS AND RIGID QUILL BEARINGS

Size Shaft, Inches	Size Quill, Inches	Floor to Top of Stand, Inches*		Plain, Each	Wedge Adjusting, Each
		Plain	Wedge Adjusting		
2 15/16 and 3 3/16	5 11/16	14 7/16	17 3/16	$60.00	$67.50
		20 7/16	23 3/16	62.50	70.00
		26 7/16	29 3/16	67.50	75.00
		32 7/16	35 3/16	72.50	80.00
3 7/16	6 3/16	13 1/8	16 1/4	67.00	77.55
		19 1/8	22 1/4	70.00	80.00
		25 1/8	28 1/4	77.50	87.50
		31 1/8	34 1/4	85.00	95.00
3 11/16	6 3/16	13 1/8	16 1/4	67.00	77.55
		19 1/8	22 1/4	70.00	80.00
		25 1/8	28 1/4	77.50	87.50
		31 1/8	34 1/4	85.00	95.00
3 15/16	6 11/16	13 1/8	16 5/8	73.00	85.00
		19 1/8	25 5/8	78.00	90.00
		25 1/8	29 5/8	85.50	97.50
		31 1/8	35 5/8	93.00	105.00
4 7/16	7 7/16	12 1/2	16 1/4	80.00	95.00
		18 1/2	22 1/4	90.00	105.00
		24 1/2	28 1/4	100.00	115.00
		30 1/2	34 1/4	110.00	125.00
4 15/16	8 3/16	12 1/2	16 1/4	80.00	95.00
		18 1/2	22 1/4	90.00	105.00
		24 1/2	28 1/4	100.00	115.00
		30 1/2	34 1/4	110.00	125.00
5 7/16	8 11/16	17 1/16	21 9/16	125.00	145.00
		23 1/16	27 9/16	137.50	157.50
		29 1/16	33 9/16	150.00	170.00
5 15/16	9 3/16	17 1/16	21 9/16	125.00	145.00
		23 1/16	27 9/16	137.50	157.50
		29 1/16	33 9/16	150.00	170.00
6 7/16	10 3/16	15 1/4	20 1/4	175.00	200.00
		21 1/4	26 1/4	190.00	215.00
		27 1/4	32 1/4	205.00	230.00
6 15/16	10 11/16	15 1/4	20 1/4	175.00	200.00
		21 1/4	26 1/4	190.00	215.00
		27 1/4	32 1/4	205.00	230.00
7 7/16	11 11/16	13 1/2	19	195.00	225.00
		19 1/2	25	210.00	240.00
		25 1/2	31	230.00	260.00
7 15/16	12 3/16	13 1/2	19	195.00	225.00
		19 1/2	25	210.00	240.00
		25 1/2	31	230.00	260.00

FOR RIGID PILLOW BLOCKS

Size Shaft, Inches	Floor to Top of Stand, Inches*		Plain, Each	Wedge Adjusting, Each
	Plain	Wedge Adjusting		
2 15/16 and 3 3/16	18 1/8	20 1/4	$55.00	$62.50
	24 1/8	26 1/4	57.50	65.00
	30 1/8	32 1/4	62.50	70.00
	36 1/8	38 1/4	67.50	75.00
3 7/16 and 3 11/16	17 1/2	19 3/4	62.50	72.50
	23 1/2	25 3/4	65.00	75.00
	29 1/2	31 3/4	72.50	82.50
	35 1/2	37 3/4	80.00	90.00
3 15/16 and 4 3/16	16 11/16	19 1/8	67.00	79.00
	22 11/16	25 1/8	72.00	84.00
	28 11/16	31 1/8	79.50	91.50
	34 11/16	37 1/8	87.00	99.00
4 7/16	15 7/8	18 5/8	72.00	87.00
	21 7/8	24 5/8	82.00	97.00
	27 7/8	30 5/8	92.00	107.00
	33 7/8	36 5/8	102.00	117.00
4 15/16	15 7/8	18 5/8	72.00	87.00
	21 7/8	24 5/8	82.00	97.00
	27 7/8	30 5/8	92.00	107.00
	33 7/8	36 5/8	102.00	117.00
5 7/16	20 1/16	23 1/4	105.00	125.00
	26 1/16	29 1/4	115.00	135.00
	32 1/16	35 1/4	127.50	147.50
	38 1/16	41 1/4	140.00	160.00
5 15/16	20 1/16	23 1/4	105.00	125.00
	26 1/16	29 1/4	115.00	135.00
	32 1/16	35 1/4	127.50	147.50
	38 1/16	41 1/4	140.00	160.00
6 7/16	18 5/8	22 1/8	150.00	175.00
	24 5/8	28 1/8	160.00	185.00
	30 5/8	34 1/8	175.00	200.00
	36 5/8	40 1/8	190.00	215.00
6 15/16	18 5/8	22 1/8	150.00	175.00
	24 5/8	28 1/8	160.00	185.00
	30 5/8	34 1/8	175.00	200.00
	36 5/8	40 1/8	190.00	215.00
7 7/16	17 7/8	21 5/8	165.00	195.00
	23 7/8	27 5/8	175.00	205.00
	29 7/8	33 5/8	190.00	220.00
	35 7/8	39 5/8	210.00	240.00
7 15/16	17 7/8	21 5/8	165.00	195.00
	23 7/8	27 5/8	175.00	205.00
	29 7/8	33 5/8	190.00	220.00
	35 7/8	39 5/8	210.00	240.00

*The dimension given is the distance from the floor to the top of the stand or, in other words, from the floor to the bottom of the base of the pillow block. To determine the height from the floor to the center of the shaft, it is only necessary to add to the dimension given the listed height of the pillow block to be used.

The height of shafting supported on these stands will vary according to the style of pillow block used.

BASE PLATES

PLAIN AND WEDGE ADJUSTING

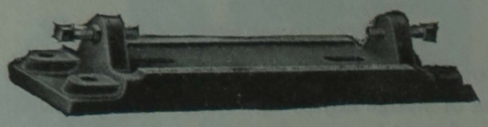


Fig. 1735

NO. T-361

For use with pillow blocks in supporting line shafting. Top and base plates and both sides of wedges are accurately machined.

FOR BALL AND SOCKET PILLOW BLOCKS

Size Shaft, Inches	Floor to Top of Base Plate, Inches* Plain	Wedge Adjusting	Plain, Each	Wedge Adjusting, Each
1 7/16 -1 11/16	7/8	2 7/8	$5.80	$8.70
1 15/16-2 3/16	1 1/8	3 3/8	7.30	10.95
2 7/16 -2 11/16	1 3/8	4	10.50	15.75
2 15/16-3 3/16	1 5/8	4 3/8	12.60	18.90
3 7/16 -3 11/16	1 3/4	4 7/8	16.80	25.20
3 15/16	2	5 1/2	21.40	32.10
4 7/16 -4 15/16	2 1/4	6	28.00	42.00
5 7/16 -5 15/16	2 3/4	7 1/4	40.60	60.90
6 7/16 -6 15/16	3 1/8	8 1/8	55.00	80.00
7 7/16 -7 15/16	3 1/2	9	70.00	100.00

FOR RING OILING RIGID AND STANDARD RIGID PILLOW BLOCKS

Size Shaft, Inches	Floor to Top of Base Plate, Inches* Plain	Wedge Adjusting	Plain, Each	Wedge Adjusting, Each
1 15/16	1 7/16	3 1/8	$6.90	$10.40
2 3/16	1 5/8	3 5/16	6.90	10.40
2 7/16	1 3/4	3 11/16	10.00	15.00
2 11/16	1 3/4	3 11/16	10.00	15.00
2 15/16	1 7/8	4	12.00	18.00
3 3/16	1 7/8	4	12.00	18.00
3 7/16	2	4 1/4	15.90	23.90
3 11/16	2	4 1/4	15.90	23.90
3 15/16	2 1/8	4 9/16	20.30	30.50
4 7/16	2 1/4	5	26.60	39.90
4 15/16	2 1/4	5	26.60	39.90
5 7/16	2 1/2	5 11/16	38.50	57.80
5 15/16	2 1/2	5 11/16	38.50	57.80
6 7/16	2 3/4	6 1/4	52.25	76.25
6 15/16	2 3/4	6 1/4	52.25	76.25
7 7/16	3 1/2	7 1/4	66.50	94.50
7 15/16	3 1/2	7 1/4	66.50	94.50

FOR RING OILING RIGID QUILL BEARINGS

Size Shaft, Inches	Size Quill, Inches	Floor to Top of Frame, Inches* Plain	Wedge Adjust'g	Plain, Each	Wedge Adjust'g, Each
2 15/16	5 11/16	2	5 3/16	$16.00	$24.50
3 7/16-3 15/16	6 3/16 -6 11/16	2 1/4	6	26.00	38.00
4 7/16-4 15/16	7 7/16 -8 3/16	2 1/2	6 1/4	34.00	50.50
5 7/16-5 15/16	8 11/16-9 3/16	2 3/4	6 13/16	48.50	70.50
6 7/16-6 15/16	10 3/16 -10 11/16	3	7 1/2	65.00	92.50
7 7/16-7 15/16	11 11/16-12 3/16	3 1/4	8 1/8	83.00	116.00

* The dimension given is the distance from the floor to the top of the stand or, in other words, from the floor to the bottom of the base of the pillow block. To determine the height from the floor to the center of the shaft, it is only necessary to add to the dimension given the listed height of the pillow block to be used.

The height of shafting supported on these plates will vary according to the style of pillow blocks used.

WALL FRAMES

PLAIN AND WEDGE ADJUSTING

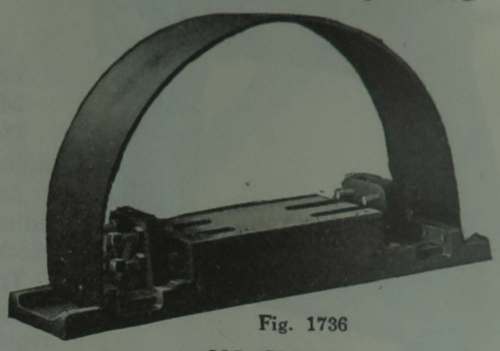


Fig. 1736

NO. T-360

Cast iron base with steel arch. Base extends beyond arch so that the frames can be securely anchored in walls. Top of base plate and both sides of wedges accurately machined. Designed for use with pillow blocks in supporting shafting where it passes through a wall.

FOR BALL AND SOCKET AND ADJUSTABLE PILLOW BLOCKS

Size Shaft, Inches	Bottom to Top of Base Plate, Inches* Plain	Wedge Adjusting	Plain, Each	Wedge Adjusting, Each
1 7/16 -1 11/16	7/8	2 7/8	$7.75	$10.65
1 15/16-2 3/16	1 1/8	3 3/8	9.75	13.40
2 7/16 -2 11/16	1 3/8	4 1/8	14.00	19.25
2 15/16-3 3/16	1 5/8	4 3/8	16.80	23.10
3 7/16 -3 11/16	1 3/4	4 7/8	22.40	30.80
3 15/16	1	5 1/2	28.55	39.25
4 7/16 -4 15/16	2 1/4	6	37.35	51.35
5 7/16 -5 15/16	2 3/4	7 1/4	54.15	74.45
6 7/16 -6 15/16	3 1/8	8 1/8	73.35	98.35
7 7/16 -7 15/16	3 1/2	9	93.35	123.35

FOR RING OILING RIGID AND STANDARD RIGID PILLOW BLOCKS

Size Shaft, Inches	Bottom to Top of Base Plate, Inches* Plain	Wedge Adjusting	Plain, Each	Wedge Adjusting, Each
1 15/16	1 5/8	3 5/16	$9.20	$12.70
2 3/16	1 5/8	3 5/16	9.20	12.70
2 7/16	1 3/4	3 11/16	13.35	18.35
2 11/16	1 3/4	3 11/16	13.35	18.35
2 15/16	1 7/8	4	16.00	22.00
3 3/16	1 7/8	4	16.00	22.00
3 7/16	2	4 1/4	21.20	29.20
3 11/16	2	4 1/4	21.20	29.20
3 15/16	2 1/8	4 9/16	27.00	27.20
4 7/16	2 1/4	5	35.50	48.80
4 15/16	2 1/4	5	35.50	48.80
5 7/16	2 1/2	5 11/16	51.30	70.50
5 15/16	2 1/2	5 11/16	51.30	70.50
6 7/16	2 3/4	6 1/4	69.65	93.65
6 15/16	2 3/4	6 1/4	69.65	93.65
7 7/16	3	6 3/4	88.70	116.70
7 15/16	3	6 3/4	88.70	116.70

FOR RING OILING RIGID QUILL BEARINGS

Size Quill, Inches	Bottom to Top of Base Plate, Inches* Plain	Wedge Adjusting	Plain, Each	Wedge Adjusting, Each
1 1/16	2	5 3/16	$21.00	$29.50
6 3/16 -6 11/16	2 1/4	5 3/4	32.50	44.50
7 7/16 -8 3/16	2 1/2	6 1/4	44.00	60.50
8 11/16-9 3/16	2 3/4	6 13/16	62.00	84.00
10 3/16 -10 11/16	3	7 1/2	83.40	110.90
11 11/16-12 3/16	3 1/4	8 1/8	107.00	140.00

*See note in other column regarding height of shafting.

WALL FRAMES

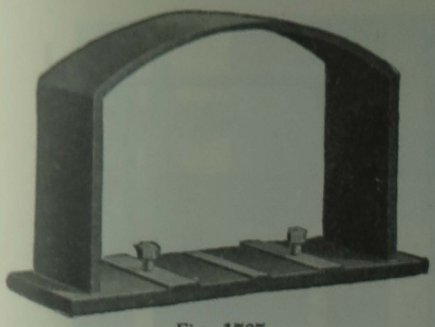


Fig. 1737

NO. T-359

Cast iron; designed for use with adjustable pillow blocks in supporting shafting where it passes through a wall. Top of base plate accurately machined. Holding down bolts are tapped into base to suit pillow block to be used. Can be used with rigid pillow blocks if no vertical adjustment is required.

FOR BALL AND SOCKET PILLOW BLOCKS

Size Shaft, Inches	Length Base, Inches	Height Over All, Inches	Each
1 3/16	16 1/2	11 1/2	$8.90
1 7/16–1 11/16	21	14	14.00
1 15/16–2 3/16	23	15 1/4	16.00
2 7/16–2 11/16	25 3/4	17 3/4	20.00
2 15/16–3 3/16	28 3/4	19	25.50
3 7/16–3 11/16	30 7/8	22 1/2	31.00
3 15/16	35 1/2	25 3/8	38.20

FOR RING OILING AND STANDARD RIGID PILLOW BLOCKS

Size Shaft, Inches	Length Base, Inches	Height Over All, Inches	Each	Size Shaft, Inches	Length Base, Inches	Height Over All, Inches	Each
1 7/16	16 1/2	11 1/2	$8.90	3 11/16	25 3/4	17 3/4	$20.00
1 11/16	16 1/2	11 1/2	8.90	3 15/16	28 3/4	19	25.50
1 15/16	16 1/2	11 1/2	8.90	4 7/16	30 7/8	22 1/2	31.00
2 3/16	16 1/2	11 1/2	8.90	4 15/16	30 7/8	22 1/2	31.00
2 7/16	21	14	14.00	5 7/16	30 7/8	22 1/2	31.00
2 11/16	21	14	14.00	5 15/16	30 7/8	22 1/2	31.00
2 15/16	23	15 1/4	16.00	6 7/16	35 1/2	25 3/8	38.20
3 3/16	23	15 1/4	16.00	6 15/16	35 1/2	25 3/8	38.20
3 7/16	25 3/4	17 3/4	20.00				

BELT SHIFTING APPLIANCES

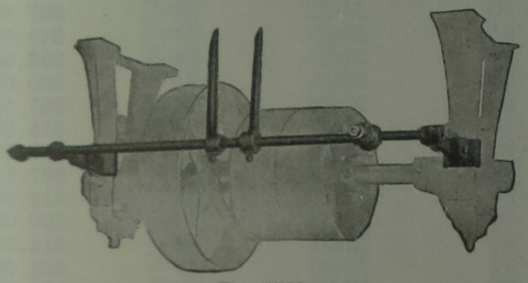


Fig. 1738

NO. T-335

Designed to attach to Universal Giant hangers or those having a similar section of frame. Arms attach to the sides of frames and can be easily attached after the frames are erected and in place. A full set comprises the following parts: 2 shifter arms, 2 shifter fingers, 2 set collars, 1 lever hub, 1 rod (standard length, 4 feet), 1 ceiling bracket.

NOS.	A	B	C	D	E
For Hangers, Inches	1 3/16	1 7/16 to 1 11/16	1 15/16 to 2 3/16	2 7/16 to 2 11/16	2 15/16 to 3 3/16
Per Set, Complete	$7.00	7.00	8.15	10.50	11.70
Arms, Each	$1.75	1.75	2.35	3.25	3.50
Fingers, Each	$1.00	1.00	1.00	1.25	1.25
Collars, Each	$0.50	.65	.65	.75	.75
Lever Hubs, Each	$1.00	1.00	1.00	1.25	1.25
Ceiling Brackets, Each	$0.75	.75	.75	1.00	1.00
Rods, Each	$1.00	1.25	1.25	1.50	1.50

SLING HANGERS

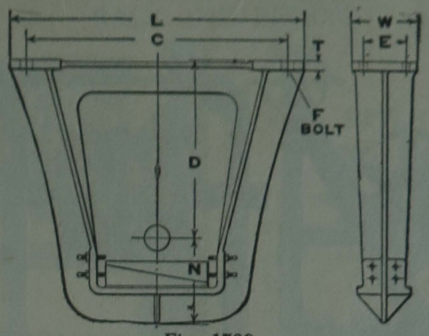


Fig. 1739

NO. T-334

Designed for extra heavy duty requiring perfect rigidity. They will sustain loads for which extra heavy ring oiling rigid pillow blocks are suited. Equipped with wedges for horizontal and vertical adjustment.

Size Shaft, Inches	Drop, Inches	Length Base, Inches	Width Base, Inches	Bolts Required	Each
2 15/16–3 3/16	18	36	8	4– 3/4	$100.00
	24	36	8	4– 3/4	105.00
	30	38	9	4– 3/4	115.00
	36	38	9	4– 3/4	125.00
3 7/16–3 11/16	18	40	9	4– 7/8	115.00
	24	40	9	4– 7/8	120.00
	30	44	10	4– 7/8	130.00
	36	44	10	4– 7/8	145.00
3 15/16	18	43	10	4–1	125.00
	24	43	10	4–1	135.00
	30	48	11	4–1	145.00
	36	48	11	4–1	160.00
4 7/16–4 15/16	18	44	11	4–1 1/8	145.00
	24	44	11	4–1 1/8	160.00
	30	50	12	4–1 1/8	175.00
	36	50	12	4–1 1/8	190.00
5 7/16–5 15/16	18	50	13	4–1 1/4	190.00
	24	50	13	4–1 1/4	205.00
	30	54	14	4–1 1/4	220.00
	36	54	14	4–1 1/4	240.00
6 7/16–6 15/16	18	56	15	4–1 3/8	260.00
	24	56	15	4–1 3/8	280.00
	30	60	16	4–1 3/8	300.00
	36	60	16	4–1 3/8	325.00
7 7/16–7 15/16	18	56	15	4–1 3/8	300.00
	24	56	15	4–1 3/8	320.00
	30	60	16	4–1 3/8	340.00
	36	60	16	4–1 3/8	365.00

Prices on application for sling hangers for quill bearings.

FIRE WALL SLEEVES

NO. T-368

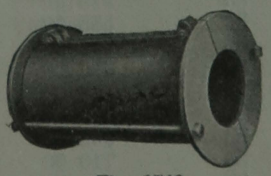


Fig. 1740

Desirable for fire protection to adjoining departments and are required in many instances in order to secure minimum insurance rates.

Made split and can be placed in an old fire wall as well as built into a new one.

The end flanges fit closely to the shaft and will prevent fire passing through wall opening.

Thickness of Wall, Inches	Shaft Sizes, Inches: 1 to 3 Each	3 1/4 to 5 3/4 Each	6 to 8 Each
9	$5.00	$8.00	$11.00
13	6.00	9.40	13.00
15	7.00	10.80	15.00
17	8.00	12.20	17.00
19	9.00	13.60	19.00
21	10.00	15.00	21.00
23	11.00	16.40	23.00
25	12.00	17.80	25.00

UPRIGHT BELT TIGHTENERS

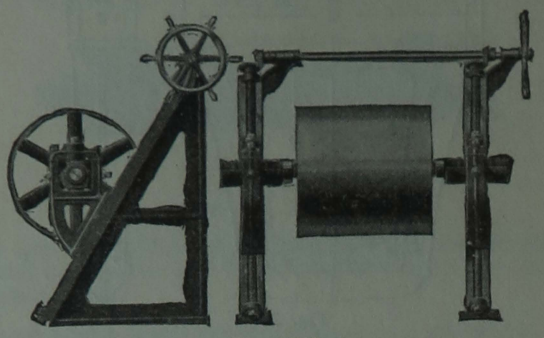


Fig. 1741

NO. T-363

Designed for severe service and particularly suitable for use with main engine drives.

The bearings are of the ring oiling ball and socket type.

When conditions require that tightener be operated from below, the hand wheel and adjusting mechanism can be placed at base of frame.

Cut shows Style A. Style B tightener is the same, except that the pulley and bearings are fitted on the vertical side of frame.

STYLE A or B

Width Belt, Inches	Size Pulley, Inches	Movement of Pulley, Inches	Each
10	20x12	24	$250.00
11	20x13	24	255.00
12	22x14	24	260.00
13	22x15	24	265.00
14	22x16	24	270.00
15	22x17	24	275.00
16	24x18	24	285.00
17	24x19	24	292.50
18	24x20	24	300.00
20	26x22	29	375.00
21	26x23	29	382.50
22	26x24	29	390.00
23	26x25	29	397.50
24	26x26	29	405.00
25	26x27	29	412.50
26	28x28	29	425.00
27	28x29	29	435.00
28	30x30	29	450.00
30	32x32	33	560.00
32	32x34	33	572.50
34	32x36	33	585.00
36	32x38	33	597.50
38	36x40	33	620.00
40	36x42	33	650.00
42	36x44	33	665.00
44	40x46	33	695.00
46	40x48	33	710.00
48	40x50	33	725.00
50	44x52	43	900.00
52	44x54	43	920.00
54	44x56	43	940.00
56	44x58	43	960.00
58	48x60	43	1000.00
60	48x62	43	1025.00
62	48x64	43	1075.00
64	48x66	43	1100.00
66	52x68	43	1150.00
68	52x70	43	1180.00
70	52x72	43	1215.00
72	52x74	43	1250.00

Unless otherwise ordered, Style A will be sent.

VERTICAL BELT TIGHTENERS

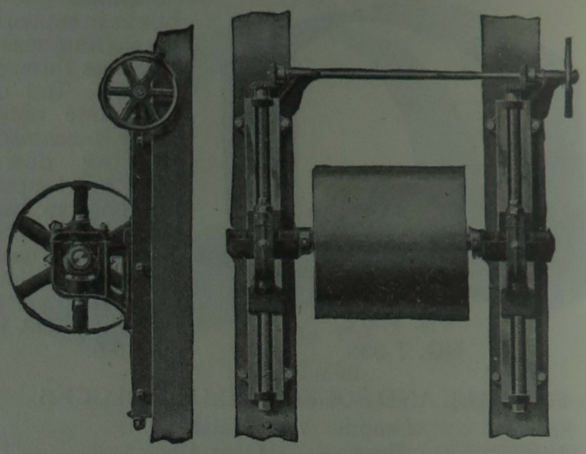


Fig. 1742

STYLE G—NO. T-364

Designed for severe service and suitable for use in heavy drives where it is desired that the frames be supported against vertical columns or posts.

The bearings are of the ring oiling ball and socket type.

If conditions require that tightener be operated from below the hand wheel, adjusting mechanism may be placed at lower ends of side frames.

Width Belt, Inches	Size Pulley, Inches	Movement of Pulley, Inches	Each
10	20x12	24	$225.00
11	20x13	24	230.00
12	22x14	24	235.00
13	22x15	24	240.00
14	22x16	24	245.00
15	22x17	24	250.00
16	24x18	24	260.00
17	24x19	24	267.50
18	24x20	24	275.00
20	26x22	34	337.50
21	26x23	34	345.00
22	26x24	34	352.50
23	26x25	34	360.00
24	26x26	34	367.50
25	26x27	34	375.00
26	28x28	34	387.50
27	28x29	34	397.50
28	30x30	34	412.50
30	32x32	42	500.00
32	32x34	42	512.50
34	32x36	42	525.00
36	32x38	42	537.50
38	36x40	42	560.00
40	36x42	42	590.00
42	36x44	42	605.00
44	40x46	42	635.00
46	40x48	42	650.00
48	40x50	42	665.00
50	44x52	54	800.00
52	44x54	54	820.00
54	44x56	54	840.00
56	44x58	54	860.00
58	48x60	54	900.00
60	48x62	54	925.00
62	48x64	54	975.00
64	48x66	54	1000.00
66	52x68	54	1050.00
68	52x70	54	1080.00
70	52x72	54	1115.00
72	52x74	54	1150.00

HORIZONTAL BELT TIGHTENERS

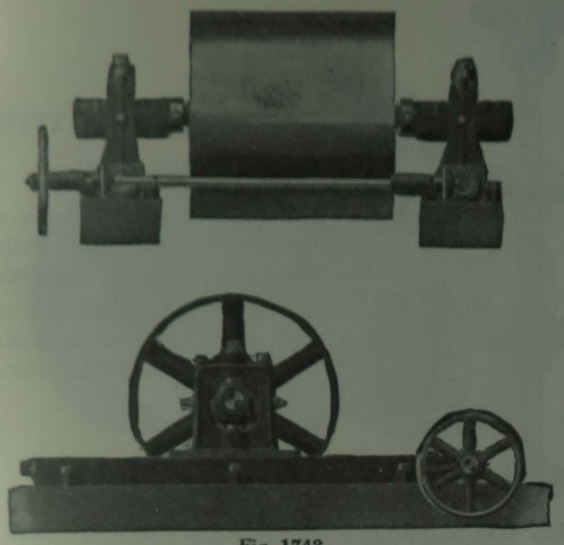


Fig. 1743

NO. T-365

Designed for severe service and suitable for use in heavy drives where it is desired that the frames be supported horizontally. Ball and socket pillow blocks support the shaft and pulley.

Width Belt, Inches	Size Pulley, Inches	Movement of Pulley, Inches	Each
10	20x12	24	$225.00
11	20x13	24	230.00
12	22x14	24	235.00
13	22x15	24	240.00
14	22x16	24	245.00
15	22x17	24	250.00
16	24x18	24	260.00
17	24x19	24	267.50
18	24x20	24	275.00
20	26x22	34	337.50
21	26x23	34	345.00
22	26x24	34	352.50
23	26x25	34	360.00
24	26x26	34	367.50
25	26x27	34	375.00
26	28x28	34	387.50
27	28x29	34	387.50
28	30x30	34	412.50
30	32x32	42	500.00
32	32x34	42	512.50
34	32x36	42	525.00
36	32x38	42	537.50
38	36x40	42	560.00
40	36x42	42	590.00
42	36x44	42	605.00
44	40x46	42	635.00
46	40x48	42	650.00
48	40x50	42	665.00
50	44x52	54	800.00
52	44x54	54	820.00
54	44x56	54	840.00
56	44x58	54	860.00
58	48x60	54	900.00
60	48x62	54	925.00
62	48x64	54	975.00
64	48x66	54	1000.00
66	52x68	54	1050.00
68	52x70	54	1080.00
70	52x72	54	1115.00
72	52x74	54	1150.00

BELT TIGHTENERS

RACK AND PINION

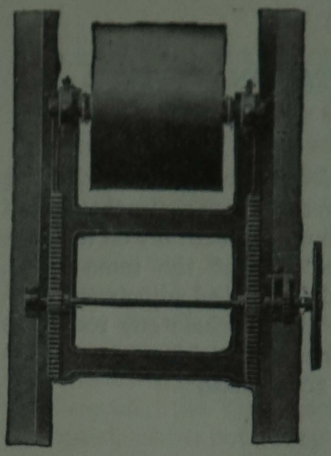


Fig. 1744

STYLE F

NO. T-366

Designed to be used vertically on wooden posts or horizontally on wooden frame. Pulley is standard double belt construction with a crown face.

Price includes iron guides but does not include wooden structure.

Width Belt, Inches	Size Pulley, Inches	Length Rack, Inches	Length Guides, Inches	Each	Mounted on Structural Iron Side Frame, Each
3—4—5	10x 6	16	31	$30.00	$37.50
6	14x 7	20	39	36.00	48.50
7	14x 8	20	39	37.00	49.50
8	14x 9	20	39	38.00	50.50
9	18x10	25	49	52.00	68.00
10	18x12	25	49	54.00	70.00
12	18x14	25	49	58.00	74.00
14	24x16	30	60	100.00	125.00
16	24x18	30	60	103.00	128.00
18	24x20	30	60	106.00	131.00
20	30x22	36	74	140.00	178.00
22	30x24	36	74	145.00	183.00
24	30x26	36	74	150.00	188.00

SWINGING TYPE

NO. T-367

Designed for light service. Bearings are plain oiling.

Pulleys are carefully balanced for high speeds.

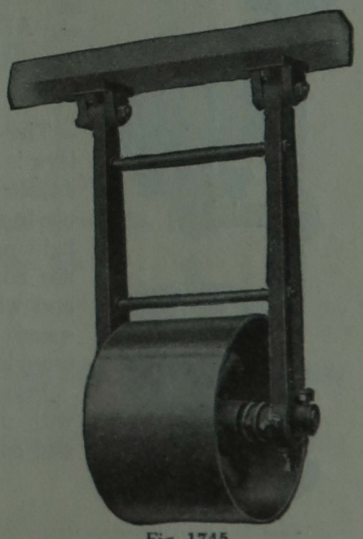


Fig. 1745

NOS.	Width Belt, Inches	Size Pulley, Inches	Distance Center to Center 3 Feet	4 Feet	5 Feet	6 Feet
	4	10x 6	$30.00	$32.00	$34.00	$36.00
	5	10x 6	30.00	32.00	34.00	36.00
1	6	14x 7	33.00	35.00	37.00	39.00
	7	14x 8	35.00	37.00	39.00	41.00
	8	14x 9	38.00	40.00	42.00	44.00
	10	18x11½	50.00	55.00	60.00	65.00
	12	18x13½	53.00	58.00	63.00	68.00
2	14	24x16	65.00	70.00	75.00	80.00
	16	24x18	70.00	75.00	80.00	85.00
	18	24x20	75.00	80.00	85.00	90.00

MULE STANDS

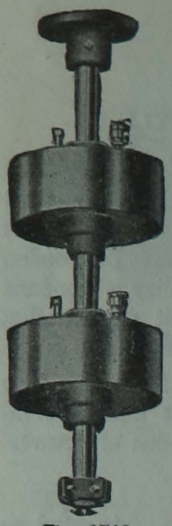


Fig. 1746

STATIONARY TYPE

NO. T-369

Used for guiding belts transmitting light powers between shafts that are not parallel but are practically on the same level and run at the same speed. Arranged for vertical adjustment only.

Prices given include guy rods with turnbuckles for tightening and compression grease cups.

NOS.	Width Belt, Inches	Size Pulleys, Inches	Standard Length Shaft, Feet	Each
1	3	12x 4¼	3½	$37.50
2	4	12x 5¼	4	42.50
2	5	12x 6¼	4	45.00
4	6	15x 7¼	4½	52.00
4	7	15x 8¼	4½	55.00
4	8	20x 9½	5	65.00
5	9	20x10½	5	88.00
5	10	24x11½	5⅛	100.00
6	12	30x13½	5½	140.00
6	14	30x15½	6	155.00

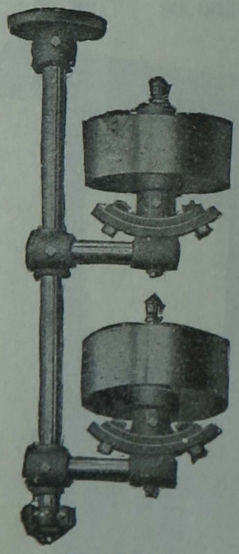


Fig. 1747

ADJUSTABLE TYPE

NO. T-370

The arrangement of the pulleys is such that they may be adjusted in any direction. For use in guiding belts transmitting light power between shafts that are not parallel to each other and which operate at different speeds or are not placed on the same level.

Prices given include guy rods with turnbuckles for tightening and compression grease cups.

NOS.	Width Belt, Inches	Size Pulleys, Inches	Standard Length Shaft, Feet	Each
1	3	12x 4¼	3½	$60.00
2	4	12x 5¼	4	67.50
2	5	12x 6¼	4½	70.00
4	6	15x 7¼	5	90.00
4	7	15x 8¼	5	95.00
4	8	20x 9½	5½	100.00
5	9	20x10½	5½	135.00
5	10	24x11½	6	147.00
6	12	30x13½	6½	200.00
6	14	30x15½	7	215.00

BINDER FRAMES

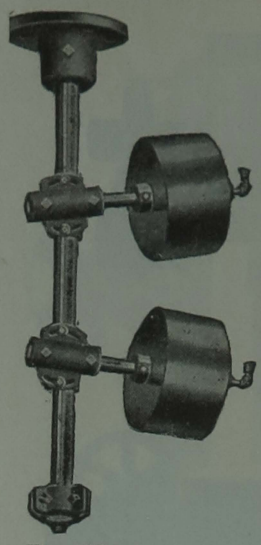


Fig. 1748

SINGLE BRACE TYPE

NO. T-371

Made for guiding belts not wider than six inches. Pulleys are adjustable in every direction.

Prices given include guy rods with turnbuckle for tightening, and compression grease cups.

NOS.	Width Belt, Inches	Size Pulleys, Inches	Standard Length Shaft, Feet	Each
2	3	12x4	3½	$46.00
2	4	12x5	4	50.00
4	5	12x6	4	70.00
4	6	15x7	4½	75.00

DOUBLE BRACE TYPE

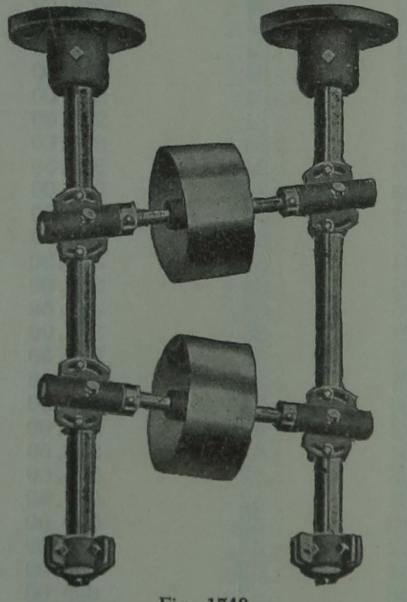


Fig. 1749

NO. T-372

Made for guiding belts up to 12 inches wide.

Pulleys that may be adjusted in any direction. Particularly adapted for guiding belt at right angles when main line is on another floor.

Prices given include guy rods with turnbuckles for tightening and compression grease cups.

NOS.	Width Belt, Inches	Size Pulleys, Inches	Standard Length Shaft, Feet	Each
2	4	12x 5	4	$75.00
2	5	12x 6	4	78.00
2	6	15x 7	4½	81.00
2	7	15x 8	4½	85.00
4	8	20x 9	5	125.00
4	10	20x12	5½	130.00
4	12	20x14	5½	135.00

RIGHT ANGLE TRANSMISSION

ALMOND

NO. T-375

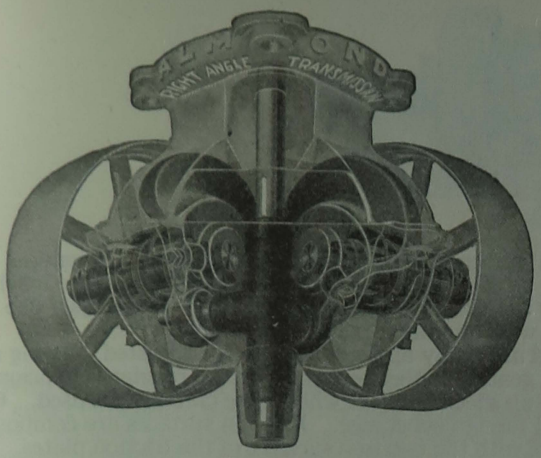


Fig. 1750

An entirely self-contained device designed for use wherever it is desirable to transmit power at right angles. Made in three sizes. The friction loss is from 7 to 10 per cent, which is less than with the ordinary countershaft. It does not throw oil; runs perfectly quiet and requires no attention except to renew oil monthly. The motion is positive and there is no variation in angular velocity.

The pulleys are not placed on the shafts but on sleeves, thus causing the pulleys to overhang the bearings and making outboard hangers unnecessary. The sleeves are of large diameter. A pulley of greater torque or twisting strain than the regular pulley should not be used.

In erecting, the Transmission must be suspended as illustrated, as it is built to operate in that position only.

Distance between centers of pulleys should be at least ten feet whenever possible.

Only standard size cast-iron pulleys furnished with the Transmission should be used.

Pulleys on the driving and driven lines must be of proper diameter to run the Transmission as near as possible to the maximum speed given in the table, as this is to the advantage of the Transmission. The maximum speed, however, must not be exceeded.

Any decrease from the maximum speed means a proportional decrease in its H.P. capacity.

The standard Transmission has two pulleys of the same style; but where it is desired to operate an individual machine, a wide-face pulley may be used on Transmission and loose pulley on machine.

Use only a light, free-flowing mineral oil. Never use grease, graphite, fish or animal oil, such as lard, as it will gum and fill the oil holes. Oil should be renewed monthly. Sample can of oil furnished with the coupling.

Shipped ready to hang in position and must not be taken apart.

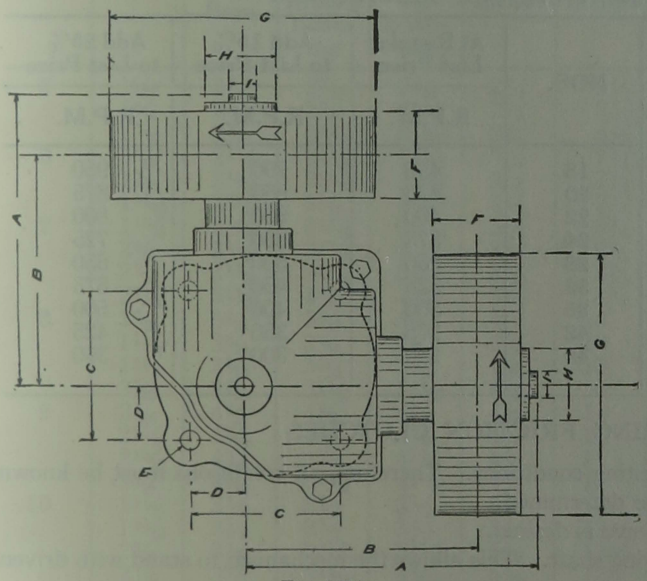


Fig. 1751

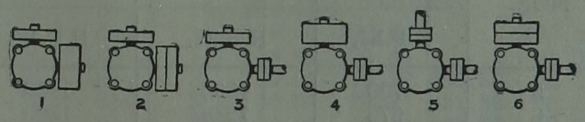


Fig. 1752 Fig. 1753 Fig. 1754 Fig. 1755 Fig. 1756 Fig. 1757

Plan 1—Wide face pulley one side.

2—Tight and loose pulley one side.

3—Direct connected one side.

4—Direct connected one side; wide face pulley on other side.

5—Direct connected both sides (an application that is not recommended).

6—Direct connected one side, tight and loose pulley on other side.

NOS.	Dimensions in Inches											H.P.	Max. Speed R.P.M.	Min. Speed R.P.M.	Weight Each, Lbs.	Each
	A	B	C	D	E Diam.	F	G	H	I	Depth of Hole E	Drop to Center of Shaft					
1	13⅜	10½	6⅞	2½	⅞	4	12	3⅛	1 3/16	1	7½	5	500	450	160	$80.00
2	17	12½	10	3¾	1¼	6	16	3¾	1 7/16	1⅛	9	10	400	350	320	125.00
3	21	17¼	13½	4¾	1½	9	20	4 7/16	1 15/16	1⅜	13	20	350	300	650	250.00

Special prices for other than standard will be furnished on request.

FRICTION CLUTCHES

UNIVERSAL GIANT

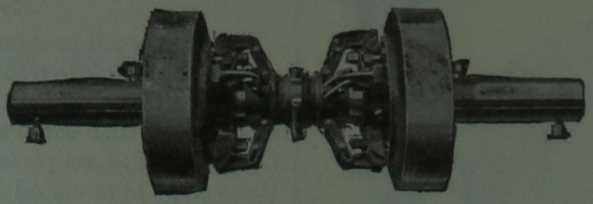


Fig. 1758

Friction clutches are used to secure greater flexibility in transmitting and distributing power to various shop departments and individual machines. Attached to line shafts as couplings or to pulleys driving directly to machines, the load is picked up while shafting is running at full speed. By the use of friction clutch cut off couplings a line shaft or any part of it may be cut out or operated without interfering with any other part of the shop.

Clutches are made in compact form of unusual strength and are easily applied and readily adjusted. Being made with an extended sleeve of standard diameter, an ordinary pulley, gear, rope sheave, or sprocket of regular dimensions can be used by simply keying it to sleeve of clutch. No need to make up special pulleys when these clutches are used. Outer rim covers and protects the friction surfaces from dust, dirt and foreign substance. Friction surfaces are composed of hardwood blocks, fitted into friction disc, which come into contact with the two iron surfaces of the friction plates. This combination offers greater frictional resistance than iron to iron. No end thrust when clutch is disengaged. All parts are interchangeable.

HIGH SPEED SERVICE

Mechanism parts of these clutches will operate satisfactorily at speeds not in excess of those shown in second column of table. Split clutch mechanisms can be supplied to operate at the higher speeds shown in third column and solid clutch mechanisms for speeds shown in the third and fourth columns. When thus furnished, they will be charged at list prices of regular clutches plus the percentage shown in table. For clutches having sleeves, cast integral with covers, the extra percentage will be computed on complete clutch lists and for clutches with separate sleeves, the extra percentage will be figured on list prices of mechanism. Prices of clutches made to operate at higher speeds than shown in table will be quoted on application. Careful consideration must be given to selection of proper type sleeves for high speed clutches. When speed of surface in contact with shaft is about 500 feet per minute ball bearing sleeves are recommended for use.

MAXIMUM SPEED OF FRICTION CLUTCH MECHANISM

NOS.	At Regular List Price	Add 15% to List Price	Add 25% to List Price	NOS.	At Regular List Price	Add 15% to List Price	Add 25% to List Price
	R.P.M.	R.P.M.	R.P.M.		R.P.M.	R.P.M.	R.P.M.
5	700	1300	1900	18	450	700	950
6	675	1235	1800	20	425	650	875
7	650	1175	1700	22	400	600	800
8	625	1110	1600	24	375	550	725
9	600	1050	1500	28	350	500	650
10	575	985	1400	32	325	450	575
11	550	925	1300	36	300	400	500
12	525	860	1200	42	275	350	425
14	500	800	1100	48	250	300	350
16	475	750	1025				

SUGGESTIONS FOR ORDERING FRICTION CLUTCHES

A friction clutch, to operate properly, should meet existing conditions. Therefore, all conditions must be known and given with order, so that proper size of clutch may be determined.

1. State if cut-off coupling or clutch with extended sleeve is desired.

If a cut-off coupling the hub should be attached to driving shaft. This allows the mechanism to stand with driven shaft when disengaged.

2. Give bore or size of shaft. Cut-off couplings may be bored to connect different diameter shafts.

3. Give speed at which clutch will be operated. This is necessary, as power of clutch is conditioned upon speed it will run.

Construction of sleeve and method of lubrication are affected by speed.

4. Advise size and description of article to be attached to sleeve and which clutch will be required to drive. This information is necessary to figure power capacity of article to be driven. It is not good policy to use clutch with rated capacity less than pulley, sheave or gear to be driven.

5. Give full information as to character of service. State if load is steady or intermittent, as clutch rating is based on a steady, even load and a larger clutch must be used for intermittent work.

6. Give maximum amount of power clutch will be required to transmit.

Where conditions will permit always place a friction clutch on the driven shaft, as the sleeve will revolve on standing shaft when clutch is disengaged; whereas, if placed on driving shaft the sleeve would stand idle on revolving shaft. This will wear bore of sleeve out of round.

Unless otherwise ordered, we will furnish solid clutches.

SINGLE DISC SOLID FRICTION CLUTCHES

UNIVERSAL GIANT

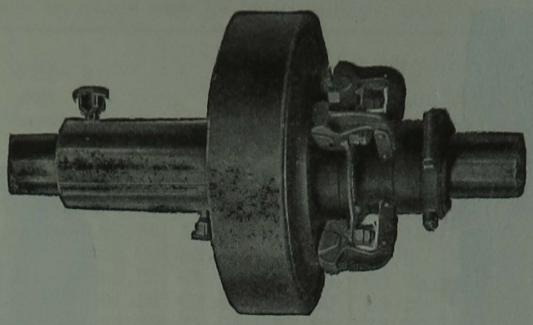


Fig. 1759

NO. T-387

With sleeves integral of standard diameters to receive pulleys, gears, sprockets, etc., with standard bores.

Duplex clutches to work together may be supplied in all sizes and are extensively used for two speed or reverse motion service. Pulleys, gears or other necessary parts of standard patterns can be fitted directly to extended sleeves. Will be supplied at price of two separate clutches of the same size. If the space on the shaft is limited so as not to permit the use of a clutch with standard length sleeve, clutches with shorter sleeves can be furnished. In no instance should the length through bore of sleeve be less than 1¼ times nominal width of pulley face.

Clutches are furnished with standard cast iron sleeves or with sleeves with phosphor-bronze or bronze graphite bushings. The standard sleeves are counterbored to make a reservoir for lubricant and have continuous spiral groove cut from end to end of counterbore. When bushings are used they are fitted into sleeve so as to leave an open space at center, which provides ample capacity for lubricant. Grease cups are fitted into each end of sleeve. Price of clutch and pulley is obtained by adding the net cost of clutch to the net cost of pulley.

NOS.	Shaft Size, Inches	Outside Diameter of Sleeve, Inches			Length Bushing, Inches	Outside Dia. Clutch, Inches	Length Over All, Inches	Length Sleeve, Inches	Horse Power at 100 R.P.M.	With Plain Bore Sleeves, Each	With Bronze Bushed Sleeves, Each	With Bronze Graphite Bushed Sleeves, Each	With Babbitted Sleeves, Each
		With Plain Bore	With Phosphor-Bronze Bushing	With Bronze Graphite Bushing									
5	15/16	2 7/16	2 7/16	2 7/16	2 3/4	6 1/2	12 1/2	5 1/2	1 3/4	$18.00	.....	.....	.....
	1 3/16	2 7/16	2 7/16	2 11/16	2 3/4	6 1/2	12 1/2	5 1/2	1 3/4	18.00	$25.80	.....	$20.50
	1 7/16	2 7/16	2 15/16	2 15/16	2 3/4	6 1/2	12 1/2	5 1/2	1 3/4	18.00	26.50	.....	21.00
6	1 3/16	2 11/16	2 11/16	2 11/16	3 1/4	7 3/4	14 1/2	6 1/2	3	20.00	28.50	$30.20	22.70
	1 7/16	2 11/16	2 15/16	2 15/16	3 1/4	7 3/4	14 1/2	6 1/2	3	20.00	29.40	31.30	23.15
	1 11/16	2 11/16	3 3/16	3 3/16	3 1/4	7 3/4	14 1/2	6 1/2	3	20.00	29.80	32.40	23.30
7	1 15/16	3 11/16	3 11/16	3 11/16	3 1/4	8 3/4	14 1/2	6 1/2	3	24.75	35.15	39.05	27.90
	2 3/16	3 11/16	3 11/16	3 11/16	3 1/4	8 3/4	14 1/2	6 1/2	3	24.75	35.35	41.05	28.10
	2 7/16	3 11/16	3 15/16	3 15/16	3 1/4	8 3/4	14 1/2	6 1/2	3	24.75	35.65	42.85	28.30
	2 11/16	3 11/16	4 3/16	4 3/16	3 1/4	8 3/4	14 1/2	6 1/2	3	24.75	36.15	46.85	28.60
8	1 7/16	3 3/16	3 3/16	3 3/16	4 1/4	10	17 7/8	8 1/2	5 1/2	26.00	36.20	38.40	31.40
	1 11/16	3 3/16	3 3/16	3 3/16	4 1/4	10	17 7/8	8 1/2	5 1/2	26.00	36.60	39.50	31.60
	1 15/16	3 3/16	3 7/16	3 7/16	4 3/4	10	17 7/8	8 1/2	5 1/2	26.00	37.00	41.30	31.80
	2 3/16	3 3/16	3 11/16	3 11/16	4 1/4	10	17 7/8	8 1/2	5 1/2	26.00	37.50	43.40	32.10
9	2 7/16	4 3/16	4 3/16	4 3/16	4 1/4	11	17 7/8	8 1/2	5 1/2	32.50	44.70	51.70	36.50
	2 11/16	4 3/16	4 3/16	4 7/16	4 1/4	11	17 7/8	8 1/2	5 1/2	32.50	45.20	56.00	36.75
	2 15/16	4 3/16	4 7/16	4 11/16	4 1/4	11	17 7/8	8 1/2	5 1/2	32.50	45.50	57.00	37.00
	3 3/16	4 3/16	4 11/16	4 15/16	4 1/4	11	17 7/8	8 1/2	5 1/2	32.50	46.10	58.70	37.30
10	1 11/16	3 1/2	3 1/2	3 1/2	5 5/8	12 1/4	21 7/8	11 1/4	10	36.00	48.00	51.40	42.00
	1 15/16	3 1/2	3 1/2	3 1/2	5 5/8	12 1/4	21 7/8	11 1/4	10	36.00	48.50	53.40	42.25
	2 3/16	3 1/2	3 11/16	3 11/16	5 5/8	12 1/4	21 7/8	11 1/4	10	36.00	49.80	55.20	42.50
	2 7/16	3 1/2	3 15/16	4 3/16	5 5/8	12 1/4	21 7/8	11 1/4	10	36.00	50.00	57.00	42.75
	2 11/16	3 15/16	4 3/16	4 7/16	5 5/8	12 1/4	21 7/8	11 1/4	10	39.50	54.10	65.80	43.10
	2 15/16	3 15/16	4 7/16	4 11/16	5 5/8	12 1/4	21 7/8	11 1/4	10	39.50	54.50	66.90	43.50
11	3 3/16	5 3/16	5 3/16	5 3/16	5 5/8	13 1/4	21 7/8	11 1/4	10	44.00	59.60	73.40	49.20
	3 7/16	5 3/16	5 3/16	5 3/16	5 5/8	13 1/4	21 7/8	11 1/4	10	44.00	60.00	74.70	49.50
	3 11/16	5 3/16	5 3/16	5 7/16	5 5/8	13 1/4	21 7/8	11 1/4	10	44.00	60.60	76.70	49.80
	3 15/16	5 3/16	5 7/16	5 11/16	5 5/8	13 1/4	21 7/8	11 1/4	10	44.00	61.40	79.30	50.20
12	1 15/16	3 1/2	3 1/2	3 1/2	6 1/16	14 1/2	23 1/4	12 1/8	15	45.00	58.90	64.50	49.60
	2 3/16	3 1/2	3 11/16	3 11/16	6 1/16	14 1/2	23 1/4	12 1/8	15	45.00	60.20	66.30	49.90
	2 7/16	3 1/2	3 15/16	4 3/16	6 1/16	14 1/2	23 1/4	12 1/8	15	45.00	60.50	68.10	51.20
	2 11/16	3 15/16	4 3/16	4 7/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	65.40	79.20	51.50
	2 15/16	4 7/16	4 11/16	4 15/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	66.20	80.50	51.90
	3 3/16	4 7/16	4 11/16	4 15/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	67.00	82.50	52.30
	3 7/16	4 15/16	5 3/16	5 7/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	67.50	84.50	52.80
	3 11/16	4 15/16	5 3/16	5 7/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	68.70	85.80	53.30
	3 15/16	5 7/16	5 7/16	5 11/16	6 1/4	14 1/2	23 5/8	12 1/2	15	49.50	69.10	89.10	53.80

List prices include shifter fork and fulcrum plate.

SINGLE DISC SOLID FRICTION CLUTCHES

UNIVERSAL GIANT

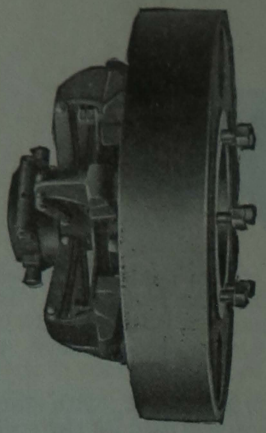


Fig. 1760

NO. T-381

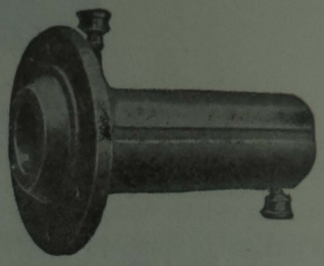


Fig. 1761

The sleeves of No. 14 and larger clutches are made separately in lengths to suit width of face of pulley to be used, and when bolted in place, become part of the clutch. Without sleeves can be attached to quills, drums or machines. This feature is of especial advantage in that it can be readily adopted to special conditions such as embodied in the construction of machines wherein clutch drives are required. Sleeves for gears or sprockets should be as long as the standard length for pulleys of equal capacity. High speed clutches are furnished at a slight advance in price. Clutches operating at high speed should be fitted with sleeves with phosphor bronze or bronze graphite bushings. Standard cast iron sleeves are counterbored to make a reservoir for the lubricant and have continuous spiral groove cut from end to end of counterbore. When bushings are used they are fitted into the sleeves so as to leave an open space at center, which provides ample space for lubricant. To obtain list prices of Nos. 14 to 32, single disc split clutches add 25 per cent to list prices of solid clutches of same size.

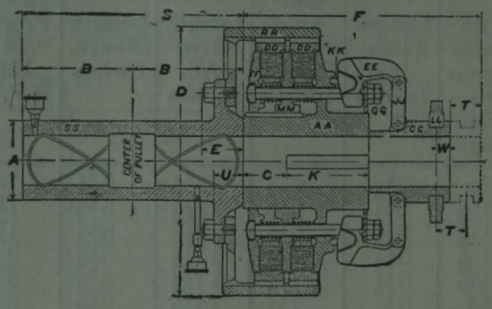


Fig. 1762

Dimensions in Inches

NOS.	H. P. at 100 R.P.M.	Max Bore	C	D	E	F	K	T	U	W
14	20	4½	1⅞	16½	2⅛	11⅞	3½	1¾	1½	1
16	25	5	2⅛	19	2½	13½	4	2	1¾	1⅛
18	34	5½	2	21½	2⅝	14¼	4½	2¼	1⅞	1⅛
20	45	6	1¾	24	2⅞	14¾	5	2½	2	1⅛
22	55	6	1½	26	2⅞	14¾	5½	2½	2	1⅛
24	65	7½	1⅝	29	3¼	16⅝	6	2¾	2 5/16	1¼
28	85	8	1	34	3⅝	18⅝	7	3½	2 9/16	1¼
32	120	8½	1½	38	43¾	20⅝	8	4	2½	1¼
36	150	9	1	43	4	23½	9	4	2¾	1½
42	180	9½	0	49	4	23½	10	4	2¾	1½
48	240	10	0	56	4¾	27	11	5	3¼	1¾

S = Length of Sleeves B = One-half of S

NOS.	Face of Pulley, Inches									
	6	8	10	12	14	16	18	20	22	24
	Length of Sleeve, Inches									
14	9	11	13	15	17	19	....	....	....	....
16	9¼	11¼	13¼	15¼	17¼	19¼	21¼	....	....	....
18	....	....	13⅜	15⅜	17⅜	19⅜	21⅜	23⅜	....	....
20	....	....	13½	15½	17½	19½	21½	23½	....	....
22	....	....	13½	15½	17½	19½	21½	23½	....	....
24	....	....	13¾	15¾	17¾	19¾	21¾	23¾	....	....
28	....	....	....	16	18	20	22	24	....	....
32	....	....	....	....	....	20¼	22¼	24¼	26¼	28¼

Quills are recommended for large clutches.

SINGLE DISC SOLID FRICTION CLUTCHES

UNIVERSAL GIANT

With plain bored sleeves separate, to which may be fitted pulleys, gears, sprockets, etc.

Clutch NOS.	Range of Bores in Clutch, Inches	Outside Diam. Sleeve, Inches	Horse Power at 100 R.P.M.	Without Sleeve, Each	Clutch with Sleeve for Pulley Face Width, Inches								
					6 Each	8 Each	10 Each	12 Each	14 Each	16 Each	18 Each	20 Each	24 Each
14	1 15/16-2 1/2	3 15/16	20	$47.50	$56.50	$57.25	$58.00	$58.75	$59.50	$60.50	$61.50	$62.50	.....
	2 9/16-3	4 7/16	20	47.50	57.75	58.55	59.35	60.15	60.95	62.00	63.10	64.20	.....
	3 1/16-3 1/2	4 15/16	20	47.50	59.00	59.85	60.70	61.55	62.45	63.50	64.60	65.75	.....
	3 9/16-4	5 7/16	20	47.50	60.25	61.15	62.05	62.95	63.85	65.00	66.20	67.40	.....
	4 1/16-4 1/2	5 15/16	20	47.50	61.50	62.50	63.50	64.50	65.50	66.75	68.00	69.25	.....
16	2 3/16-2 3/4	4 7/16	25	60.00	70.75	71.50	72.25	73.00	73.75	74.75	75.75	76.75	.....
	2 13/16-3 1/4	4 15/16	25	60.00	72.00	72.80	73.60	74.40	75.20	77.25	78.35	79.45	.....
	3 5/16-3 3/4	5 7/16	25	60.00	73.25	74.15	75.05	75.95	76.85	78.00	79.20	80.40	.....
	3 13/16-4 1/4	5 15/16	25	60.00	74.75	75.75	76.75	77.75	78.75	80.00	81.25	82.50	.....
	4 5/16-4 3/4	6 7/16	25	60.00	76.25	77.35	78.45	79.55	80.65	82.00	83.50	84.00	.....
	4 13/16-5	6 15/16	25	60.00	77.75	79.00	80.25	81.50	82.75	84.25	85.75	87.25	.....
18	2 7/16-3	4 15/16	34	75.00	87.50	88.30	89.10	89.90	90.95	92.00	93.10	94.20	.....
	3 1/16-3 1/2	5 7/16	34	75.00	88.75	89.65	90.55	91.45	92.35	93.50	94.70	95.90	.....
	3 9/16-4	5 15/16	34	75.00	90.25	91.25	92.25	93.25	94.25	95.00	96.75	98.00	.....
	4 1/16-4 1/2	6 7/16	34	75.00	91.75	92.85	93.95	95.05	96.15	97.50	99.00	100.50	.....
	4 9/16-5	6 15/16	34	75.00	93.25	94.50	95.75	97.00	98.25	99.75	101.25	102.75	.....
	5 1/16-5 1/2	7 7/16	34	75.00	94.75	96.15	97.55	98.95	100.35	102.00	103.75	105.50	.....
20	2 11/16-3 1/4	5 7/16	45	95.00	....	....	112.00	113.00	113.90	114.95	116.25	117.45	$119.50
	3 5/16-3 3/4	5 15/16	45	95.00	....	....	113.50	114.50	115.50	116.75	118.00	119.25	122.25
	3 13/16-4 1/4	6 7/16	45	95.00	....	....	114.00	115.25	116.50	118.00	119.50	121.00	124.00
	4 5/16-4 3/4	6 15/16	45	95.00	....	....	116.00	117.50	119.00	120.50	122.00	124.00	128.50
	4 13/16-5 1/4	7 7/16	45	95.00	....	....	118.00	119.50	121.00	122.50	124.00	126.00	131.00
	5 5/16-5 3/4	7 15/16	45	95.00	....	....	119.50	121.00	122.50	124.00	125.75	127.50	132.00
	5 13/16-6	8 7/16	45	95.00	....	....	121.50	123.25	125.00	126.75	128.75	130.75	134.75
22	2 11/16-3 1/4	5 7/16	55	120.00	....	....	137.00	138.00	138.90	139.95	141.25	142.45	144.50
	3 5/16-3 3/4	5 15/16	55	120.00	....	....	138.50	139.50	140.50	141.75	143.00	144.50	147.25
	3 13/16-4 1/4	6 7/16	55	120.00	....	....	139.00	140.25	141.50	143.00	144.50	146.00	149.00
	4 5/16-4 3/4	6 15/16	55	120.00	....	....	140.50	142.50	144.00	145.50	147.00	149.00	153.50
	4 13/16-5 1/4	7 7/16	55	120.00	....	....	142.50	144.50	146.00	147.50	149.00	151.00	156.00
	5 5/16-5 3/4	7 15/16	55	120.00	....	....	144.50	146.00	147.50	149.00	150.75	152.50	157.00
	5 13/16-6	8 7/16	55	120.00	....	....	146.50	148.25	150.00	151.75	153.75	155.75	159.75
24	2 15/16-3 1/2	5 15/16	65	150.00	....	....	170.00	171.00	172.00	173.25	174.50	175.75	178.75
	3 9/16-4	6 7/16	65	150.00	....	....	172.00	173.75	174.50	176.00	177.50	179.00	182.00
	4 1/16-4 1/2	6 15/16	65	150.00	....	....	174.00	176.00	177.50	179.00	180.50	182.50	187.00
	4 9/16-5	7 7/16	65	150.00	....	....	177.00	179.00	180.50	182.00	183.50	185.50	190.50
	5 1/16-5 1/2	7 15/16	65	150.00	....	....	180.00	181.50	183.00	184.50	186.25	188.00	192.50
	5 9/16-6	8 7/16	65	150.00	....	....	183.00	184.75	186.50	188.50	190.25	192.25	196.50
	6 1/16-6 1/2	8 15/16	65	150.00	....	....	186.00	188.00	190.00	192.00	194.25	196.50	201.00
	6 9/16-7	9 7/16	65	150.00	....	....	189.00	191.25	193.50	195.50	198.25	200.75	205.75
	7 1/16-7 1/2	9 15/16	65	150.00	....	....	192.00	194.50	197.00	199.50	202.00	205.00	211.00
28	3 7/16-4	6 15/16	85	180.00	....	....	....	207.00	208.50	210.00	211.50	213.50	218.00
	4 1/16-4 1/2	7 7/16	85	180.00	....	....	....	210.00	211.50	213.00	214.50	216.50	221.50
	4 9/16-5	7 15/16	85	180.00	....	....	....	213.00	214.50	216.00	217.75	219.50	224.00
	5 1/16-5 1/2	8 7/16	85	180.00	....	....	....	216.00	218.00	220.00	222.00	224.00	228.00
	5 9/16-6	8 15/16	85	180.00	....	....	....	220.00	222.50	225.00	227.25	229.50	234.00
	6 1/16-6 1/2	9 7/16	85	180.00	....	....	....	225.00	227.50	230.00	232.50	235.00	240.00
	6 9/16-7	9 15/16	85	180.00	....	....	....	232.00	235.00	237.50	240.00	243.00	249.00
	7 1/16-7 1/2	10 7/16	85	180.00	....	....	....	239.00	242.00	245.00	248.00	251.00	260.00
	7 9/16-8	10 15/16	85	180.00	....	....	....	249.00	252.00	255.00	258.50	262.00	271.00
32	3 15/16-4 1/2	7 15/16	120	230.00	....	....	....	....	....	268.50	270.25	272.00	276.50
	4 9/16-5	8 7/16	120	230.00	....	....	....	....	....	272.50	274.50	276.50	280.50
	5 1/16-5 1/2	8 15/16	120	230.00	....	....	....	....	....	277.50	279.75	282.00	286.50
	5 9/16-6	9 7/16	120	230.00	....	....	....	....	....	285.00	287.50	290.00	295.00
	6 1/16-6 1/2	9 15/16	120	230.00	....	....	....	....	....	292.50	295.00	298.00	304.00
	6 9/16-7	10 7/16	120	230.00	....	....	....	....	....	300.00	303.00	306.00	315.00
	7 1/16-7 1/2	10 15/16	120	230.00	....	....	....	....	....	310.00	313.50	317.00	326.00
	7 9/16 -8	11 7/16	120	230.00	....	....	....	....	....	315.00	329.00	333.00	343.00
	8 1/16-8 1/2	11 15/16	120	230.00	....	....	....	....	....	340.00	345.00	350.00	362.50
	8 9/16-9	12 7/16	120	230.00	....	....	....	....	....	355.00	360.00	365.00	385.00
36	4 7/16 -9		150	300.00	....	....	....	....	....	....	....	....	....
42	4 15/16-9 1/2		180	450.00	....	....	....	....	....	....	....	....	....
48	4 15/16-10		240	750.00	....	....	....	....	....	....	....	....	....

Quills are recommended for use with pulleys of greater capacity than our No. 32 clutch.

Price of clutch and pulley, complete, is obtained by adding net cost of clutch with sleeve to net cost of regular pulley of proper bore. Prices include yoke and fulcrum for lever.

To obtain the price of Nos. 14 to 32 single disc split clutches, add 25 per cent to list price of solid clutch of same size. Price includes yoke and fulcrum for lever.

SINGLE DISC SPLIT FRICTION CLUTCHES

UNIVERSAL GIANT

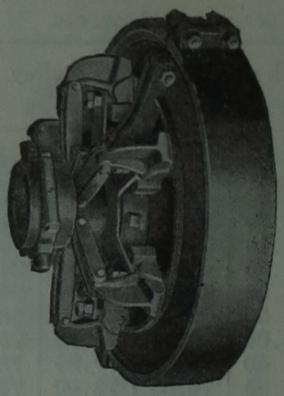


Fig. 1763

NO. T-379

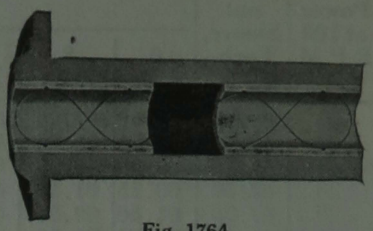


Fig. 1764

Split clutches can be furnished in all sizes from No. 7 up. The prices given below are for clutches up to No. 12. To obtain the price of Nos. 14 to 32 single disc split clutches, add 25 per cent to list price of solid clutches of same size. Furnished with separate sleeve in length to suit width of face of pulley to be used. Sleeves for gears or sprockets should be as long as the standard length for pulleys of equal capacity. Standard cast iron sleeves are counterbored to make a reservoir for the lubricant and have continuous spiral groove cut from end to end of counterbore. When bushings are used, they are fitted into the sleeves so as to leave an open space at center, which provides ample space for lubricant.

Price List with plain bore sleeves separate to which may be fitted pulleys, gears, sprockets, etc.

NOS.	Range of Bores, Inches	Outside Diameter Plain Bore Sleeve, Inches	H. P. at 100 R.P.M.	Clutch Without Sleeve, Each	Clutch With Sleeve for Pulley Face Width, Inches						
					4 Each	5 Each	6 Each	7 Each	8 Each	10 Each	12 Each
7	1 13/16-2 3/4	3 11/16	3 1/2	$36.00	$44.00	$44.50	$45.00	.....	.....	.....	.....
8	1 7/16-2 1/4	3 3/16	5 1/2	37.00	45.00	45.50	46.00	$46.75	$47.50	.....	.....
9	2 5/16-3 1/4	4 3/16	6	42.00	51.50	52.00	52.50	53.25	54.00	.....	.....
10	1 11/16-2 1/2	3 1/2	10	45.40	54.40	54.90	55.40	56.15	56.90	$57.70	.....
10	2 9/16-3	3 15/16		49.70	59.95	60.45	60.95	61.70	62.45	63.25	.....
11	3 1/16-4	5 3/16	11	50.00	.....	.....	62.00	62.75	63.50	64.40	$65.30
12	1 15/16-2 1/2	3 1/2	15	51.50	.....	.....	62.75	63.50	64.25	65.15	66.05
12	2 9/16-2 3/4	3 15/16	.....	56.00	.....	.....	68.50	69.30	70.15	72.10	73.05
12	2 13/16-3 1/4	4 7/16	.....	56.00	.....	.....	69.75	70.60	71.50	72.50	73.50
12	3 5/16-3 3/4	4 15/16	.....	56.00	.....	.....	71.00	72.00	73.00	74.00	75.25
12	3 13/16-4	5 7/16	.....	56.00	.....	.....	72.25	73.25	74.25	75.50	77.00

Note.—To obtain prices of Single Disc Split Clutches, Nos. 14 to 32, add 25% to list of Single Disc Solid Clutches.

NOS.	Length Sleeve, Inches Nominal Face of Pulley in Inches												
	4	5	6	7	8	10	12	14	16	18	20	22	24
7	8	9	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
8	8	9	10	11	12	.....	.....	.....	.....	.....	.....	.....	.....
9	8	9	10	11	12	.....	.....	.....	.....	.....	.....	.....	.....
10	8	9	10	11	12	14	.....	.....	.....	.....	.....	.....	.....
11	.....	.....	10	11	12	14	16	.....	.....	.....	.....	.....	.....
12	.....	.....	10	11	12	14	16	18	20	.....	.....	.....	.....
14	.....	.....	10	11	12	14	16	18	20	.....	.....	.....	.....
16	.....	.....	10 1/4	11 1/4	12 1/4	14 1/4	16 1/4	18 1/4	20 1/4	22 1/4	.....	.....	.....
18	.....	.....	.....	.....	.....	14 1/2	16 1/2	18 1/2	20 1/2	22 1/2	24 1/2	.....	.....
20	.....	.....	.....	.....	.....	15	17	19	21	23	25	.....	.....
22	.....	.....	.....	.....	.....	15	17	19	21	23	25	.....	.....
24	.....	.....	.....	.....	.....	15 1/4	17 1/4	19 1/4	21 1/4	23 1/4	25 1/4	.....	.....
28	.....	.....	.....	.....	.....	.....	17 1/2	19 1/2	21 1/2	23 1/2	25 1/2	27 1/2	29 1/2
32	.....	.....	.....	.....	.....	.....	.....	.....	22	24	26	28	30

Prices Include Yoke and Fulcrum for Lever

DOUBLE DISC SOLID FRICTION CLUTCHES

UNIVERSAL GIANT

NO. T-388

Clutches and cut-off couplings for heavy duty are made with a double set of friction discs and plates. By this method of construction a powerful clutch can be produced without making it abnormally large in diameter. Furnished with separate sleeves to which may be fitted gears, sprockets, pulleys, etc.

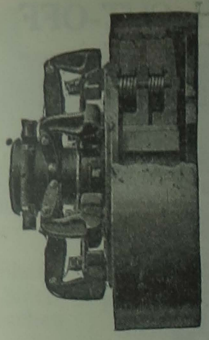


Fig. 1765

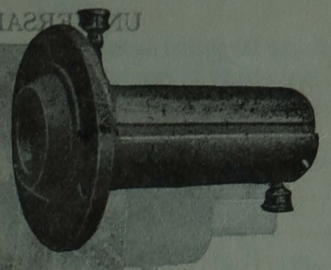


Fig. 1766

NOS.	Range of Bores, Inches,	Outside Diam. of Plain Bored Sleeve, Inches	H.P. at 100 R.P.M.	Without Sleeve, Each	With Sleeve for Pulley Face Width, Inches 6 Each	8 Each	10 Each	12 Each	14 Each	16 Each	18 Each	20 Each	22 Each	24 Each
	1 11/16-1 15/16	3 15/16	30	$60.00	$69.50	$70.25	$71.00	$71.75	$72.50	$73.50	$74.50	$75.50		
	2 3/16-2 11/16	4 7/16	30	60.00	70.75	71.50	72.25	73.00	73.75	74.75	75.75	76.75		
12	2 15/16-3 3/16	4 15/16	30	60.00	72.00	72.80	73.60	74.40	75.20	77.25	78.35	79.45		
	3 1/16-3 11/16	5 7/16	30	60.00	73.25	74.15	75.05	75.95	76.85	78.00	79.20	80.40		
	1 15/16-2 3/16	4 7/16	40	80.00	91.25	92.05	92.85	93.65	94.65	94.70	95.80	96.90		
	2 7/16-2 15/16	4 15/16	40	80.00	92.50	93.30	94.10	94.90	95.95	97.00	98.10	99.20		
14	3 3/16-3 7/16	5 7/16	40	80.00	93.75	94.65	95.55	96.45	97.35	98.50	99.70	100.90		
	3 11/16-3 15/16	5 15/16	40	80.00	95.25	96.25	97.25	98.25	99.25	100.00	101.75	103.00		
	4 3/16	6 7/16	40	80.00	96.75	97.85	98.95	100.05	101.15	102.50	104.00	105.50	.....	.....
	2 3/16-2 7/16	4 15/16	50	100.00	114.00	114.80	115.60	116.50	117.30	118.30	119.50	119.70	$120.70	$121.70
	2 11/16-3 3/16	5 7/16	50	100.00	115.20	116.10	117.00	118.00	118.90	119.95	121.25	122.45	123.45	124.50
16	3 7/16-3 11/16	5 15/16	50	100.00	116.70	117.60	118.50	119.50	120.50	121.75	123.00	124.25	125.75	127.25
	3 15/16-4 3/16	6 7/16	50	100.00	117.00	118.00	119.00	120.25	121.50	123.00	124.50	126.00	127.50	129.00
	4 7/16-4 15/16	6 15/16	50	100.00	119.50	120.75	121.00	122.50	124.00	125.50	127.00	129.00	131.25	133.50
	2 3/16-2 7/16	4 15/16	68	125.00	141.00	142.00	143.00	144.00	145.50	147.00	148.50	150.00	152.00	154.50
	2 11/16-2 15/16	5 7/16	68	125.00	142.00	143.00	144.50	146.00	147.50	149.00	150.75	152.50	154.50	157.00
18	3 3/16-3 7/16	5 15/16	68	125.00	143.50	145.00	146.50	148.25	150.00	151.75	153.75	155.75	157.75	159.75
	3 11/16-3 15/16	6 7/16	68	125.00	145.50	147.00	148.50	150.00	151.75	153.75	155.75	158.75	159.75	162.00
	4 3/16-4 7/16	6 15/16	68	125.00	147.50	149.00	150.75	152.50	154.50	156.50	158.75	161.00	163.50	166.00
	4 11/16-4 15/16	7 7/16	68	125.00	149.50	151.25	153.00	155.00	157.00	159.25	161.50	164.00	166.50	169.25
	2 7/16-2 11/16	5 15/16	90	160.00	.....	.....	181.50	183.00	184.50	186.25	188.00	190.00	192.00	194.25
	2 15/16-3 3/16	6 7/16	90	160.00	.....	.....	184.50	186.25	188.00	190.00	191.75	193.75	195.75	198.00
20	3 7/16-3 15/16	6 15/16	90	160.00	.....	.....	187.50	189.50	191.50	193.50	195.25	197.50	200.00	203.00
	4 3/16-4 7/16	7 7/16	90	160.00	.....	.....	190.50	192.75	195.00	197.25	199.50	202.00	205.00	208.00
	4 11/16-4 15/16	7 15/16	90	160.00	.....	.....	194.00	196.50	199.00	201.50	204.00	207.00	210.50	214.00
	5 7/16	8 7/16	90	160.00	.....	.....	198.00	200.50	203.00	206.00	209.00	212.50	216.00	220.00
	2 15/16-3 3/16	6 7/16	110	200.00	.....	.....	226.50	228.50	230.50	232.50	234.50	236.50	239.00	241.50
	3 7/16-3 15/16	6 15/16	110	200.00	.....	.....	229.50	231.50	233.50	235.50	237.50	240.00	242.50	245.00
22	4 3/16-4 7/16	7 7/16	110	200.00	.....	.....	232.50	234.50	237.00	239.50	242.00	244.50	248.00	251.00
	4 11/16-4 15/16	7 15/16	110	200.00	.....	.....	237.00	239.50	242.00	245.00	248.00	251.00	254.50	258.00
	5 7/16	8 7/16	110	200.00	.....	.....	243.00	246.00	249.00	252.00	255.00	258.50	262.00	265.00
	2 15/16-3 3/16	6 15/16	130	250.00	.....	.....	282.50	284.50	286.50	288.50	291.00	292.50	295.00	297.50
	3 7/16-3 11/16	7 7/16	130	250.00	.....	.....	285.50	287.50	289.50	292.00	294.50	297.00	300.00	303.00
	3 15/16-4 7/16	7 15/16	130	250.00	.....	.....	289.00	291.00	293.50	296.00	298.50	301.50	305.00	309.00
24	4 11/16-4 15/16	8 7/16	130	250.00	.....	.....	293.00	295.50	298.00	300.50	303.50	307.00	310.50	316.00
	5 7/16	8 15/16	130	250.00	.....	.....	299.00	301.50	303.00	306.00	309.50	313.00	317.00	323.00
	5 15/16	9 7/16	130	250.00	.....	.....	305.00	307.50	310.00	313.00	316.00	320.00	324.00	331.00
	6 7/16	9 15/16	130	250.00	.....	.....	312.00	314.50	317.00	320.00	323.00	327.00	332.00	340.00
	6 15/16	10 7/16	130	250.00	.....	.....	320.00	323.00	326.00	330.00	334.00	339.00	344.00	353.00
	3 7/16-3 15/16	7 15/16	170	300.00	.....	.....	.....	341.00	343.50	346.00	349.00	352.00	355.50	359.00
	4 3/16-4 7/16	8 7/16	170	300.00	.....	.....	.....	345.00	347.50	350.50	353.50	357.00	361.00	365.00
	4 11/16-4 15/16	8 15/16	170	300.00	.....	.....	.....	350.00	353.00	356.00	359.50	363.50	367.50	372.00
28	5 7/16	9 7/16	170	300.00	.....	.....	.....	356.00	359.00	362.50	366.50	370.50	375.00	380.00
	5 15/16	9 15/16	170	300.00	.....	.....	.....	363.00	366.50	370.50	374.50	379.00	384.00	389.00
	6 7/16	10 7/16	170	300.00	.....	.....	.....	371.00	375.00	379.00	383.50	388.50	394.50	400.00
	6 15/16	10 15/16	170	300.00	.....	.....	.....	380.00	384.00	388.50	393.50	399.50	405.00	412.00
	7 7/16	11 7/16	170	300.00	.....	.....	.....	392.00	396.00	401.00	407.00	414.00	422.00	430.00
32	3 15/16-8 3/8		240	400.00										
36	4 7/16-8 7/8		300	500.00										
42	4 15/16-9 3/8		360	675.00										
48	4 15/16-9 7/8		480	900.00										

Quills are recommended for use with clutches of greater Capacity than No. 28 Double Disc

Price includes yoke and fulcrum for lever.

FRICTION CLUTCH CUT-OFF COUPLINGS

UNIVERSAL GIANT

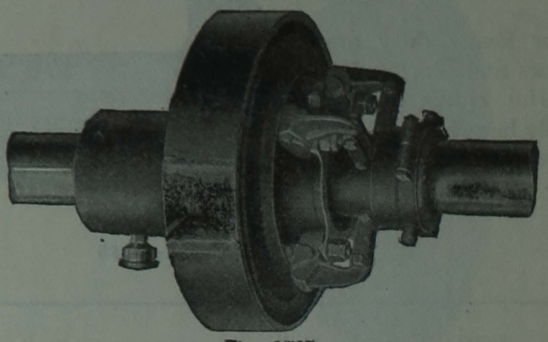


Fig. 1767

NO. T-389

Single Disc, Solid and Split

By the use of friction clutch cut-off couplings, a line shaft or any part of it may be cut out or operated without interfering with any other part of the shop.

This is especially advantageous when it is necessary to make repairs during working hours or to run one department when the remainder of plant is closed down.

It is not a safe practice to use clutch couplings of smaller sizes than specified, unless it is known absolutely that the power to be transmitted from one shaft to the other is less than the capacity of coupling indicated. There is always a possibility of the power requirements being increased at some future time, either by putting more pulleys on the shafts or by increasing the length of the line.

In fitting the Universal Giant Coupling, the ends of shafts to be connected meet within the hub on back of clutch. This makes a true male and female connection and insures absolute alignment of shafts.

A phosphor-bronze bushing is provided to carry the end of extended shaft.

In the table below the sizes of couplings which should be used to connect the various sizes of shafting are indicated in the second column.

Hubs of split clutch cut-off couplings are made solid.

NOS.	For Shaft, Inches	Max. Bore, Inches	H. P. at 100 R.P.M.	Solid, Each	Split, Each
5	15/16	1 1/2	1 3/4	$18.00	.....
6	1 3/16	1 3/4	3	20.00	.....
8	1 7/16	2 1/4	5 1/2	26.00	$44.00
10	1 11/16	3	10	36.00	52.90
12	1 15/16	4	15	45.00	60.00
14	2 3/16	4 1/2	20	56.00	68.00
16	2 7/16	5	25	75.00	90.00
18	2 11/16	5 1/2	34	96.00	116.00
20	2 15/16	6	45	120.00	145.00
22	3 3/16	6	55	150.00	180.00
24	3 7/16	7 1/2	65	180.00	210.00
28	3 15/16	8	85	220.00	260.00
32	4 7/16	8 1/2	120	275.00	320.00
36	4 15/16	9	150	350.00	410.00
42	5 7/16	9 1/2	180	525.00	615.00
48	5 15/16	10	240	850.00	1000.00

Solid Friction Clutch Cut-off Couplings will be furnished on all orders unless split couplings are specified.

Prices include shifting fork and fulcrum.

An additional charge of 10 per cent will be made for cut-off couplings when furnished reducing for shafts of different diameters.

FRICTION CLUTCH CUT-OFF COUPLINGS

UNIVERSAL GIANT

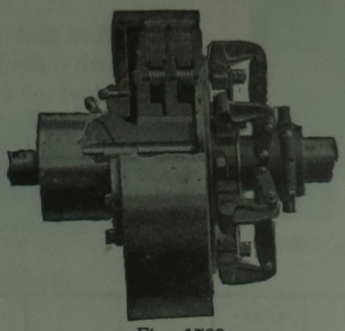


Fig. 1768

NO. T-378

Double Disc, Solid and Split

Friction clutch cut-off couplings for heavy duty are made with double set of friction discs and plates, and are shown in list as DD, meaning double disc. By this method of construction a powerful clutch can be produced without making it abnormally large in diameter.

It is not a safe practice to use clutch couplings of smaller sizes than specified, unless it is known absolutely that the power to be transmitted from one shaft to the other is less than the capacity of coupling indicated. There is always a possibility of the power requirements being increased at some future time, either by putting more pulleys on the shafts or by increasing the length of the line.

In fitting the Universal Giant Coupling, the ends of shafts to be connected meet within the hub on back of clutch. This makes a true male and female connection and insures absolute alignment of shafts.

A phosphor-bronze bushing is provided to carry the end of extended shaft.

In the table below the sizes of couplings which should be used to connect the various sizes of shafting are indicated in the second column. Hubs of split clutch cut-off couplings are made solid.

NOS.	Diam. of Shaft, Inches	Max. Bore, Inches	H. P. at 100 R.P.M.	Solid, Each	Split, Each
12-DD	2 11/16	3 1/8	30	$75.00	$93.00
14-DD	2 15/16	4 3/8	40	95.00	115.00
16-DD	3 3/16	4 7/8	50	125.00	150.00
18-DD	3 11/16	5 3/8	68	160.00	195.00
20-DD	3 15/16	5 7/8	90	200.00	240.00
22-DD	4 3/16	5 7/8	110	245.00	295.00
24-DD	4 7/16	7 3/8	130	300.00	350.00
28-DD	4 15/16	7 7/8	170	360.00	420.00
32-DD	5 7/16	8 3/8	240	470.00	550.00
36-DD	5 15/16	8 7/8	300	580.00	680.00
42-DD	6 7/16	9 3/8	360	785.00	920.00
48-DD	6 15/16	9 7/8	480	1040.00	1220.00

Solid clutch cut-off couplings will be furnished on all orders unless split couplings are specified.

Prices include shifting fork and fulcrum.

An additional charge of 10 per cent will be made for cut-off couplings when furnished reducing for shafts of different diameters.

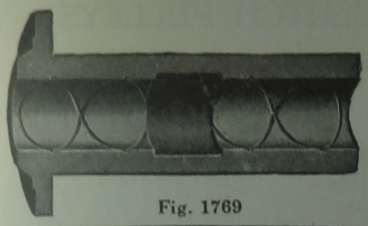


Fig. 1769

BUSHINGS

FOR UNIVERSAL GIANT FRICTION CLUTCHES

PHOSPHOR-BRONZE—NO. T-383

Constructed of high grade metal and equipped with continuous spiral oil groove. In cutting the groove, the machine is set to allow the loop to cut out at inside end of each bushing. These open ends will pull the oil into the groove no matter in which direction sleeve is running.

Shaft Size, Inches	Outside Diameter Bushings, Inches	Per Pair, Fitted in Sleeve of Clutch or Hub of Pulley or Sleeve — Length of Bushings, Inches											
		2¼	2¾	3¼	4¼	5¼	6¼	7¼	8¼	9¼	10¼	11¼	12¼
1 3/16	1½	$7.80	$8.50	$9.30	$10.20	$11.50	.....	.....	.....	.....	.....	.....	.....
1 7/16	1 15/16	8.50	9.40	10.20	11.10	12.40	.....	.....	.....	.....	.....	.....	.....
1 11/16	2 3/16	8.90	9.80	10.60	12.00	13.30	.....	.....	.....	.....	.....	.....	.....
1 15/16	2 7/16	9.20	10.40	11.00	12.50	13.90	$15.70	$17.10	$18.50	$20.10	$21.20	.....	.....
2 3/16	2 11/16	9.50	10.60	11.50	13.80	15.20	17.00	18.30	19.70	21.20	22.60	.....	.....
2 7/16	2 15/16	10.00	10.90	12.20	14.00	15.50	17.50	18.60	20.10	21.50	23.10	.....	.....
2 11/16	3 3/16	10.20	11.40	12.70	14.60	15.90	18.00	19.60	20.90	22.60	24.40	.....	.....
2 15/16	3 7/16	10.60	11.90	13.00	15.00	16.70	18.60	20.40	22.30	23.80	25.70	.....	.....
3 3/16	3 11/16	.....	.....	13.60	15.60	17.50	19.20	21.20	23.20	24.90	26.70	.....	.....
3 7/16	3 15/16	.....	.....	14.00	16.00	18.00	20.20	22.20	24.20	26.20	28.20	.....	.....
3 11/16	4 3/16	.....	.....	14.50	16.60	19.20	21.20	23.60	25.60	27.50	29.70	.....	.....
3 15/16	4 7/16	.....	.....	15.00	17.40	19.60	22.20	24.50	26.60	28.80	31.20	.....	.....
4 3/16	4 15/16	.....	.....	17.20	20.30	23.40	26.50	29.50	32.30	35.20	38.00	.....	.....
4 7/16	5 3/16	.....	.....	18.20	21.40	24.50	27.70	30.80	34.00	37.00	40.00	$43.50	$48.00
4 11/16	5 7/16	.....	.....	19.00	22.40	25.70	28.90	32.50	35.80	38.90	41.90	45.50	50.00
4 15/16	5 11/16	.....	.....	19.40	23.20	26.60	29.90	33.50	37.30	40.60	43.60	48.00	53.00
5 7/16	6 3/16	.....	.....	20.50	24.20	27.90	31.60	35.70	39.30	42.60	46.60	51.00	56.00
5 15/16	6 11/16	.....	.....	22.30	26.50	30.20	34.00	38.40	42.00	46.60	50.60	55.00	60.00

BRONZE GRAPHITE—NO. T-384

Constructed of high grade phosphor-bronze. On the bearing surface are cast symmetrical grooves. Grooves are packed solid with a special fine hard lubricating graphite. Requires a small quantity of oil when started, after which they become self-lubricating.

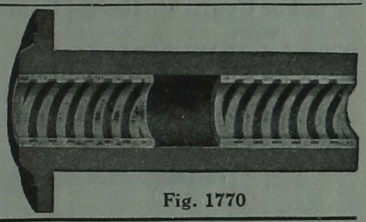


Fig. 1770

Shaft Size, Inches	Outside Diameter Bushings, Inches	Per Pair, Fitted in Sleeve of Clutch or Hub of Pulley or Sleeve — Length of Bushings, Inches											
		2¼	2¾	3¼	4¼	5¼	6¼	7¼	8¼	9¼	10¼	11¼	12¼
1 3/16	1 11/16	$9.00	$10.20	$11.30	$13.30	$15.50	.....	.....	.....	.....	.....	.....	.....
1 7/16	1 15/16	10.05	11.30	12.40	14.30	16.60	.....	.....	.....	.....	.....	.....	.....
1 11/16	2 3/16	11.50	12.40	13.50	15.40	17.70	.....	.....	.....	.....	.....	.....	.....
1 15/16	2 7/16	13.25	14.30	15.30	17.40	19.50	$22.60	$25.00	$27.50	.....	.....	.....	.....
2 3/16	2 11/16	15.10	16.30	17.40	19.20	21.30	24.40	27.20	29.80	$33.00	$35.80	.....	.....
2 7/16	2 15/16	17.00	18.10	19.20	21.00	23.10	26.00	29.90	32.40	34.60	38.60	$43.00	.....
2 11/16	3 7/16	20.70	22.10	23.50	26.30	29.70	35.00	37.70	41.00	44.80	49.90	55.50	.....
2 15/16	3 11/16	21.75	23.10	24.50	27.40	31.00	36.10	40.40	44.20	47.60	52.80	60.40	$67.60
3 3/16	3 15/16	.....	.....	26.20	29.40	33.00	38.40	42.60	47.00	51.00	56.40	64.00	71.50
3 7/16	4 3/16	.....	.....	28.30	30.70	35.00	40.60	44.90	50.20	54.70	60.30	67.50	76.00
3 11/16	4 7/16	.....	.....	28.80	32.70	36.30	42.80	48.10	53.40	58.90	64.50	71.40	80.80
3 15/16	4 11/16	.....	.....	31.40	35.30	39.60	45.30	51.50	57.70	62.80	69.70	76.90	85.20

Prices for larger bushings will be quoted upon application. Prices are for a pair (2 complete bushings). Single bushings will be furnished at one-half of these list prices.

Split bushings will be furnished at a list price of 25 per cent greater than list prices of solid bushings.

To determine proper length of bushings for use in sleeves of clutches, Nos. 5 to 12, inclusive, use the following table:

CLUTCH NOS.	5	6	7	8	9	10	11	12
Length of Bushing, Inches	2¼	2¾	2¾	3¼	3¼	4¼	4¼	5¼

Length of bushings for clutches Nos. 14 and larger is determined by face width of pulley to be used upon clutch sleeve. To decide upon proper length bushing use the following table:

Face of Pulley, Inches	6	8	10	12	14	16	18	20	22	24
Length of Bushings, Inches	3¼	4¼	5¼	6¼	7¼	8¼	9¼	10¼	11¼	12¼

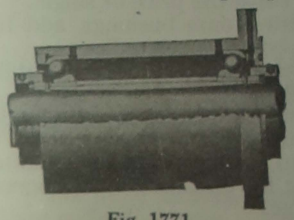


Fig. 1771

BALL BEARINGS

CHAPMAN—NO. T-385

Keep belts free from oil; eliminate practically all friction. Need lubrication but once or twice a year. Self-contained, dust proof. Sleeve clamped firmly to shaft protects it from wear. Races are of special steel; hardened, ground and polished. High grade alloy steel balls used. Can be furnished for clutches No. 8 and larger. Prices on application.

FRICTION CLUTCH SHIFTERS

FOR UNIVERSAL GIANT FRICTION CLUTCHES

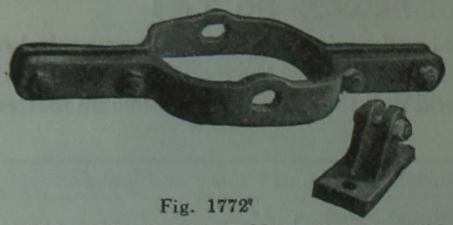


Fig. 1772

YOKE AND FULCRUM FOR LEVER—NO. T-393

Are included in the list price of each Universal Giant friction clutch and cut-off coupling.

Straight levers are readily secured by simply piecing out with flat bar iron to the required length.

In erecting, it is necessary to place swell on yoke next to clutch mechanism.

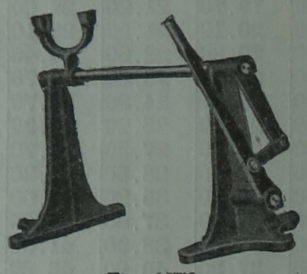


Fig. 1773

COMPOUND LEVER SHIFTER STAND—NO. T-390

For Use with Clutches NOS.	Height from Base to Center of Shaft		
	24 Inches	30 Inches	36 Inches
16–18–20–22	$32.00	$39.50	$47.00
24–28–32	35.00	42.50	50.00
36–42–48	40.00	47.50	55.00

Fig. 1774

FORK AND LEVER STANDS—NO. T-392

For Use with Clutches NOS.	Height from Base to Center of Shaft		
	24 Inches	30 Inches	36 Inches
10–12–14	$10.00	$11.50	$13.00
16–18–20–22	12.00	14.00	16.00
24–28–32	14.00	16.50	19.00
36–42–48	17.50	21.00	24.50

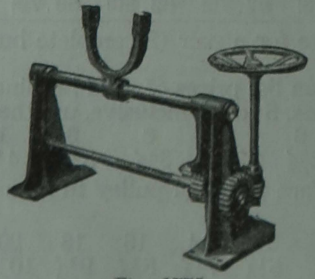


Fig. 1775

WORM GEARED SHIFTER STAND—NO. T-391

For Use with Clutches NOS.	Height from Base to Center of Shaft		
	24 Inches	30 Inches	36 Inches
24–28–32	$60.00	$70.00	$80.00
36–42–48	67.50	80.00	90.00

FRICTION CLUTCH PULLEYS

PREMIER

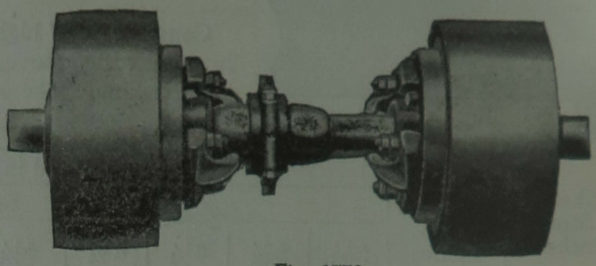


Fig. 1776

NO. T-394

Pulleys are fitted with clutches of the floating disc type; made solid only; being simple in construction and composed of very few parts, they are particularly adaptable for countershaft service. This type of clutch can be depended upon to gradually take up load, but release it instantly. When released, there is no tendency of friction surfaces to drag.

Single Belt

Dia. Pulley, Inches	Nominal Pulley Face, Inches					
	3 Each	4 Each	5 Each	6 Each	7 Each	8 Each
9	$21.55	$21.90	$22.65	$23.10	$29.10	$29.60
10	21.85	22.25	23.10	28.55	29.60	30.15
11	22.05	22.50	28.35	28.85	29.95	30.55
12	22.35	27.80	28.70	29.25	38.40	39.00
13	27.65	28.10	29.05	37.65	38.80	39.45
14	27.80	28.30	37.25	37.90	39.15	39.90
15	28.10	28.60	37.80	38.25	39.55	40.40
16	28.70	37.25	38.25	38.95	40.30	50.20
17	36.95	37.55	38.70	39.45	49.85	50.75
18	37.25	37.90	39.05	39.85	50.30	51.30
19	37.50	38.30	39.50	49.35	50.85	51.85
20	37.80	38.70	40.00	49.95	51.45	52.45
21	38.20	39.15	50.05	51.05	52.00	53.00
22	38.50	39.55	50.50	51.55	53.15	54.15
23	38.85	39.95	50.95	52.05	53.70	54.75
24	39.20	40.35	51.40	52.55	54.25	55.40

Double Belt

Dia. Pulley, Inches	Nominal Pulley Face, Inches					
	3 Each	4 Each	5 Each	6 Each	7 Each	8 Each
9	$21.85	$22.30	.....	.....	.....	.....
10	22.20	27.70	$28.60	$29.15	.....	.....
11	27.45	28.00	28.95	37.55	.....	.....
12	27.70	28.30	29.30	37.95	.....	.....
13	27.95	28.60	37.65	38.35	$39.60	$40.35
14	28.25	36.95	38.10	38.85	49.20	50.00
15	36.55	37.30	38.50	48.30	49.70	50.55
16	37.15	37.85	48.05	48.90	50.50	51.20
17	37.45	47.30	48.55	49.45	50.90	51.85
18	37.75	47.70	49.05	50.00	51.55	....
19	47.10	48.10	49.55	50.60	.....	.....
20	47.45	48.50	50.00	.....	.....	.....
21	47.90	49.00	.....	.....	.....	.....
22	48.25	49.45	.....	.....	.....	.....
23	48.65	49.90	.....	.....	.....	.....
24	49.05	.....	.....	.....	.....	.....

Prices are for plain bore fitted with grease cups.

Duplex clutch pulleys take twice the price of single.

For clutch pulleys fitted with bronze bushings, add 15 per cent to list prices of plain bored clutch pulleys.

For shifting yoke and fulcrum plate for single clutch pulleys, add to above list, **$3.00.**

For shifting yoke and fulcrum plate for duplex clutch pulleys, add to list of two clutch pulleys, **$3.00.**

For duplex clutch pulleys to be used on countershafts with rod shifter, a shifter dog for operating thrust spool will be furnished without charge.

ROPE-SHEAVES

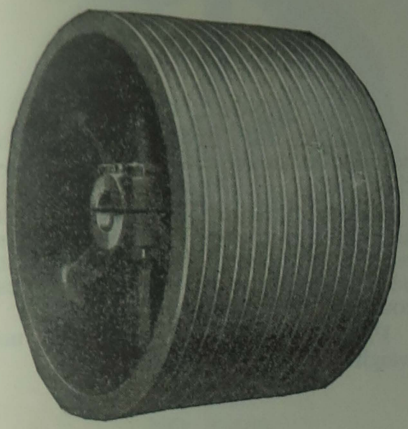


Fig. 1777

FOR ROPE TRANSMISSION

As the success of rope driving depends largely upon proper design of drive, it is advisable to submit conditions to a competent engineer for advice and suggestion. Our engineers have had years of experience in rope driving and we shall be glad to submit plans to meet conditions as they may exist in your plant. Among advantages of rope transmission are: amount of power to be transmitted is limited only by space on shaft for sheave between bearings. Distance between delivering and receiving shafts is nearly unlimited. Ropes can run in any direction: at any angle and around corners. Positive quiet and steady transmission of power. Free from electrical disturbances. Future power requirements may be provided for by using sheaves with extra grooves.

SOLID—NO. T-397

With Our Standard 45° V or 60° U Grooves

AMERICAN SYSTEM GROOVES FOR 7/8 AND 1 INCH ROPE

Pitch Diam.	Number of Grooves																	
	1 Each	2 Each	3 Each	4 Each	5 Each	6 Each	7 Each	8 Each	9 Each	10 Each	11 Each	12 Each	13 Each	14 Each	15 Each	16 Each	18 Each	20 Each
20	$12.50	$16.90	$21.20	$25.80	$30.40	$35.10	$40.00	$44.90	$50.00	$55.40	$60.80	$66.60	$72.70	$79.10	.....	.....	.....	.....
22	13.60	18.20	22.90	27.80	32.80	37.90	43.20	48.60	54.10	59.90	65.90	72.00	78.60	85.20	.....	.....	.....	.....
24	14.60	19.70	24.80	30.00	35.40	40.80	46.60	52.30	58.30	64.60	70.90	77.50	84.40	91.60	$98.80	$106.00	$120.40	$134.80
26	15.80	21.10	26.60	32.30	37.90	43.80	49.90	55.20	62.60	69.20	76.10	83.20	90.60	98.40	106.00	113.60	128.80	144.00
28	17.00	22.70	28.60	34.60	40.70	46.90	53.40	60.10	66.00	74.00	81.40	88.90	96.70	104.90	113.10	121.30	137.70	154.10
30	18.40	24.50	30.60	37.00	43.60	50.30	57.10	64.10	71.30	78.70	86.40	94.30	102.60	111.20	119.80	128.40	145.60	162.80
32	19.70	26.20	32.90	39.60	46.70	53.80	61.20	68.80	76.60	84.70	93.00	101.50	110.70	120.30	129.50	138.70	157.10	175.50
34	21.10	28.10	35.20	42.40	49.80	57.50	65.30	73.40	80.70	90.40	99.10	108.20	117.60	127.30	137.00	146.70	166.10	185.50
36	22.70	29.90	37.30	45.00	52.80	60.80	69.10	77.60	86.50	95.50	104.80	114.40	124.50	135.10	145.30	155.50	175.90	196.30
38	24.20	31.90	39.80	47.90	56.20	64.70	73.40	82.60	90.60	100.10	109.90	120.00	130.70	141.60	152.30	163.00	184.40	205.80
40	25.90	34.10	42.50	51.10	59.90	68.90	78.20	87.80	97.70	107.80	118.20	128.90	140.50	152.10	163.60	175.10	198.10	221.10
42	27.60	36.20	45.00	54.20	63.60	73.10	82.90	93.10	103.40	114.20	125.20	136.60	148.80	161.30	173.60	185.90	210.50	235.10
44	29.50	38.80	48.10	57.80	67.80	77.90	88.30	99.10	110.20	121.60	133.20	145.20	157.80	170.60	183.40	196.20	221.80	247.40
46	31.40	41.20	51.00	61.20	71.60	82.30	93.20	104.50	116.20	128.00	140.30	152.90	166.10	179.70	193.10	206.50	233.30	260.10
48	33.60	43.80	54.20	64.80	75.70	87.00	98.50	110.40	122.40	135.00	147.80	161.00	175.30	190.40	204.70	219.00	247.60	276.20
50	35.80	46.40	57.50	68.60	80.20	91.90	104.00	116.50	129.40	142.40	155.90	169.80	185.20	200.60	215.80	231.00	261.40	291.80
52	38.30	49.60	61.10	72.80	85.00	97.30	110.00	123.10	136.40	150.20	164.40	178.80	194.10	209.80	225.80	241.80	273.80	305.80
54	40.90	52.80	64.90	77.30	90.00	103.10	116.40	130.20	144.20	158.80	173.50	188.80	204.90	222.20	238.90	255.70	289.30	322.90
56	43.80	56.30	69.00	82.10	95.40	109.10	123.10	137.50	152.50	167.40	183.00	198.90	215.40	232.50	250.00	267.50	302.50	337.50
58	46.80	59.90	73.20	86.90	100.80	115.20	129.80	145.00	160.40	176.30	192.50	209.20	226.50	244.90	263.40	281.90	318.90	355.90
60	50.20	63.80	77.90	92.20	106.80	121.90	137.30	153.10	169.30	186.00	202.90	220.50	238.50	257.80	276.10	295.40	334.00	372.60
62	53.40	67.80	82.40	97.40	112.80	128.60	144.70	161.30	178.20	195.60	213.40	231.60	250.70	270.40	290.50	310.60	350.80	391.00
64	56.90	71.90	87.20	103.00	119.00	135.50	152.30	169.60	180.00	205.40	223.90	243.00	264.80	286.20	307.20	328.20	370.20	412.20
66	60.50	76.30	92.40	109.00	125.90	143.20	160.80	178.90	197.50	216.50	235.90	255.80	276.20	297.40	319.40	341.40	385.40	429.40
68	64.40	81.00	97.90	115.10	132.70	150.80	169.20	188.30	207.60	227.40	247.70	268.40	289.60	312.20	334.70	357.20	402.20	447.20
70	68.60	85.90	103.70	121.70	140.20	159.00	178.30	198.10	218.40	239.00	260.20	281.90	303.20	325.40	348.40	371.40	417.40	463.40
72	73.10	91.20	109.80	128.60	148.10	167.80	186.80	208.70	229.80	251.50	273.60	296.20	319.60	342.70	366.20	389.70	436.70	483.70
74	77.90	96.80	116.20	136.00	156.20	176.90	198.00	219.60	241.70	264.20	287.30	310.80	334.60	358.10	382.10	406.10	454.10	502.10
76	82.80	102.70	122.90	143.50	164.60	186.10	208.20	230.60	253.70	277.20	301.20	325.70	350.80	376.60	401.60	426.60	476.60	526.60
78	88.20	109.00	130.10	151.70	173.60	196.20	219.10	242.60	266.60	291.10	316.10	341.60	367.20	393.30	419.30	445.30	497.30	549.30
80	93.80	115.40	137.60	160.60	183.10	206.60	230.60	255.20	280.20	305.80	331.80	358.40	385.50	413.50	440.80	468.30	523.30	578.30
82	99.70	122.40	145.40	169.00	193.10	217.00	242.50	268.10	294.10	320.80	347.90	375.60	403.70	432.10	459.10	488.10	546.10	604.15
84	106.00	129.60	153.60	178.20	203.30	228.70	254.50	281.40	308.40	336.10	364.30	393.10	422.70	453.10	483.10	513.10	573.10	633.10
86	112.70	137.30	162.40	187.90	214.00	240.60	267.70	295.20	323.60	352.30	381.60	411.60	442.30	473.20	495.20	527.20	591.25	655.20
88	119.60	145.00	171.50	198.20	225.30	253.10	281.40	310.20	339.60	369.50	400.10	434.20	463.20	494.90	526.20	558.20	622.25	687.30
90	127.00	156.10	181.50	208.80	237.10	265.90	295.00	325.00	355.00	387.00	419.50	451.00	485.00	518.20	552.30	586.30	654.35	722.40
92	135.80	168.70	191.20	220.90	250.60	280.60	310.20	341.40	373.10	405.50	439.50	472.10	507.25	542.50	578.50	614.55	686.60	758.65
94	142.95	172.00	201.60	231.60	262.30	293.50	325.30	357.70	390.70	421.30	458.50	493.40	529.20	565.70	600.70	636.75	708.80	780.85
96	151.30	181.70	212.30	243.00	275.00	308.90	341.80	374.40	408.00	443.60	479.00	515.20	552.60	590.00	628.10	666.15	742.25	818.35
98	160.40	191.90	224.80	255.60	289.60	323.00	357.20	392.10	427.70	463.80	500.50	538.00	576.20	605.60	645.65	685.65	765.70	845.75
100	171.00	204.00	236.00	271.00	305.00	340.90	373.80	411.80	447.80	486.10	524.30	563.00	602.80	643.30	683.00	723.00	803.00	885.00
102	180.60	214.80	249.20	283.40	319.80	356.60	394.90	433.40	472.80	513.20	555.50	597.40	640.50	685.80	708.00	750.00	834.00	922.00
104	191.40	226.70	263.40	301.20	340.60	382.20	424.60	467.20	512.70	557.20	602.00	647.20	692.70	739.60	723.00	777.00	865.00	959.00
106	202.60	240.20	279.60	319.00	360.20	402.80	446.70	491.20	536.30	580.50	628.00	672.10	715.10	765.80	780.00	804.00	896.00	996.00
108	212.00	242.60	284.70	327.90	372.00	420.40	468.60	519.00	569.00	622.00	674.00	729.80	784.50	837.10	850.00	880.00	928.00	1033.00
110	222.60	266.30	314.40	364.20	415.80	470.20	527.90	586.30	646.20	707.50	768.50	830.70	895.40	960.10	1025.00	1090.15	1150.00	1215.00

EXTRAS TO BE ADDED TO STANDARD LIST PRICES

Sheaves with grooves for 1⅛ inch rope	12½%	Sheaves with grooves for 1¾ inch rope	50%
Sheaves with grooves for 1¼ inch rope	20 %	Sheaves with grooves for 2 inch rope	75%
Sheaves with grooves for 1⅜ inch rope	25 %	Clamp hub solid rim sheaves	7½%
Sheaves with grooves for 1½ inch rope	35 %	Split sheaves	10%

For sheaves with grooves for ENGLISH SYSTEM, add 25 per cent in addition to all other extras.

For loose sheaves, tapped for grease cups, if hub is not over 6 inches long, add same extras as used for 6 inch face loose pulleys.

TENSION CARRIAGE FRAMES

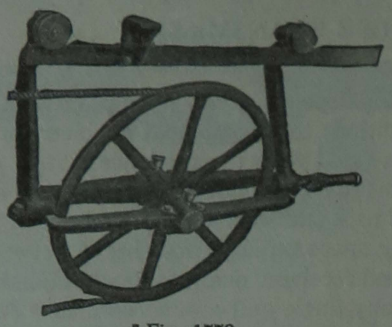


Fig. 1778

STYLE B—HORIZONTAL SINGLE TRACK

NO. T-402

This style of Tension Carriage is employed where it is necessary to occupy small space. The sheave is adjustable to any angle.

Prices include weight rods but no weights, sheaves or track.

NOS.	For Sheave Diameter, Inches	Without Sheave, Each
30	30 and smaller	$25.00
36	32 to 36 inclusive	35.00
42	38 to 42 inclusive	45.00
48	44 to 48 inclusive	60.00
54	50 to 54 inclusive	80.00
60	56 to 60 inclusive	100.00

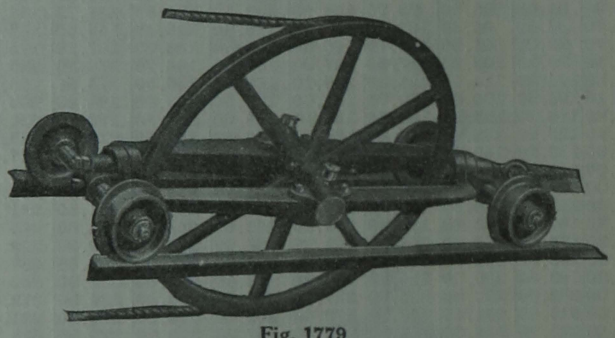


Fig. 1779

STYLE D—HORIZONTAL OR INCLINED SERVICE

NO. T-401

Provided with swivel yokes, which permit the sheaves to take inclination required.

Supporting wheel axles can be varied to accommodate wider tracks or yokes may be shifted on these axles if the centerline of track does not coincide with the centerline of drive. This feature simplifies properly locating tension equipment when erecting.

Prices include weight rods but no weights, sheaves or track.

To obtain complete price of tension carriages, add price of single groove sheave and price of tension weights to list prices given below.

NOS.	For Sheave Diameter, Inches	Without Sheave, Each
30	30 and smaller	$35.00
36	32 to 36 inclusive	48.00
42	38 to 42 inclusive	54.00
48	44 to 48 inclusive	73.00
54	50 to 54 inclusive	96.00
60	56 to 60 inclusive	125.00
66	62 to 66 inclusive	158.00
72	68 to 72 inclusive	195.00
84	74 to 84 inclusive	235.00
96	86 to 96 inclusive	280.00

TENSION CARRIAGE FRAMES

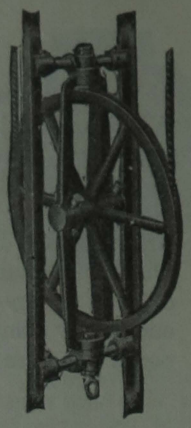


Fig. 1780

STYLE C—VERTICAL

NO. T-403

Provided with swivel yokes, which permit the sheave to take required inclination.

The combined weight of these frames and sheaves in some cases exceeds the required amount of tension weight necessary for the drive, in which cases counterbalancing is required.

Prices include weight rods but no weights, sheaves or track.

NOS.	For Sheave Diameter, Inches	Without Sheave, Each
30	Up to 30	$32.00
36	32 to 36	45.00
42	38 to 42	50.00
48	44 to 48	68.00
54	50 to 54	89.00
60	56 to 60	116.00
66	62 to 66	148.00
72	68 to 72	185.00
84	74 to 84	223.00
96	86 to 96	248.00

STYLE F—SWINGING

NO. T-404

This carriage is for use on small drives where track is unnecessary. Prices include weight rods but no weights or sheaves.

NOS.	For Sheave Diameter, Inches	Weight Frame, Lbs.	Without Sheave, Each
24	Up to 24	30	$13.25
30	26 to 30	40	14.50
36	32 to 36	50	17.00
42	38 to 42	75	18.30
48	44 to 48	100	19.60

Fig. 1781

TAIL ROPE SHEAVES

Fig. 1782

NO. T-405

Use same diameter manila rope for weight rope as used for drive.

NOS.	Size Rope, Inches	Each
1	½–1	$6.00
2	1⅛–1½	9.00
3	1⅝–2	12.00

ROPE END THIMBLES

Galvanized thimble used at each end will reduce wear on rope where attached to carriage and weight rod.

Diameter Rope, Inches	Each	Diameter Rope, Inches	Each
¾	$0.50	1⅜	$1.30
⅞	.60	1½	1.60
1	.70	1¾	2.40
1⅛	.80	2	3.50
1¼	1.00		

CAST IRON PULLEYS

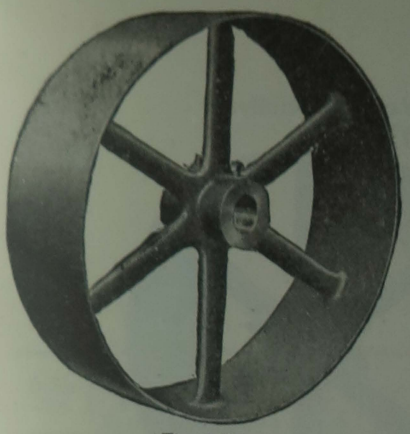


Fig. 1783
NO. T-409

Properly made cast iron pulleys are the most desirable for many purposes. The rim, arms and hub are cast in one piece; and being of a non-flexible material, they form a rigid structure which is not liable to become distorted.

The heat produced by a slipping belt cannot wear rim out of shape or cause it to buckle.

These pulleys are machine molded, are commercially perfect in every detail, symmetrical in appearance, accurately balanced, strong and true running.

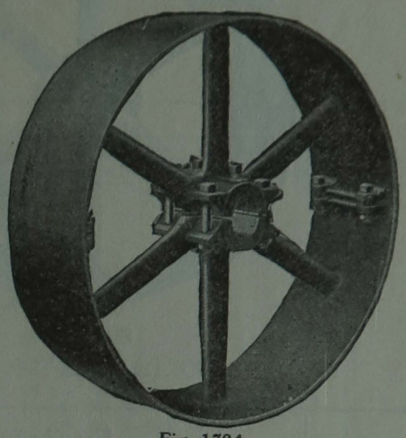


Fig. 1784
NO. T-410

Split pulleys are made solid in the casting and split apart before finishing, which process insures true running. When bolted together, the two halves intermember at rim fracture, making a permanent joint.

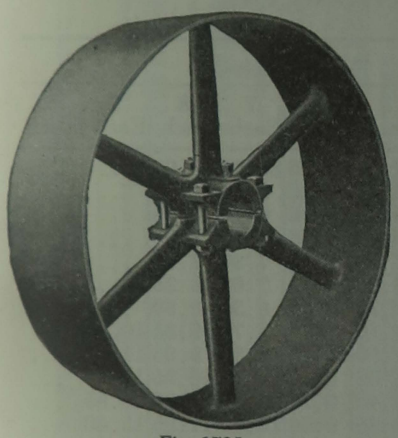


Fig. 1785
NO. T-415

Pulleys in nominal face widths greater than 24 inches are made with two or more sets of arms.

Pulleys 6 to 9 inch diameters have 4 arms to a set; 10 to 94 inch diameters, 6 arms to a set; 96 to 120 inch diameters, 8 arms to a set.

Solid rim clamp hub pulleys are often desirable where an exceptionally "close fit" to shaft is required.

List price for clamp hub pulley is obtained by adding to list price of solid pulley one-half of the difference between solid and split pulley lists.

Pulleys having bores disproportionate to their diameters can be furnished; and as the making of same is at a much greater proportionate cost than pulleys with standard bores, a list tabulating the maximum and minimum limits of bores for standard transmission pulleys, with extras to be added for pulleys with bores larger or smaller than standard limits, is given herewith. Suitable for heavy duty and high rim velocity. Strength at fracture. Suitable for rim velocities in excess of 4,000 feet per minute. Classifications of pulleys omitted.

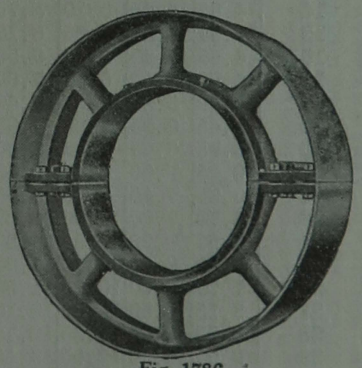


Fig. 1786
NO. T-414

Extras to be added to cost of pulleys with bores larger or smaller than standard bore limits.

Diameter Pulleys, Inches	Maximum Bore, Inches	Add for each additional					Minimum Bore, Inches	For Smaller Bores add
		1/4 Inch or Fraction	1/2 Inch or Fraction	1 Inch or Fraction	1 1/2 Inch or Fraction	2 Inch or Fraction		
6— 6 1/2	2	10%	....	....	....	....	15/16	10%
7— 8 1/2	2 1/4	10%	....	....	....	....	15/16	10%
9— 9 1/2	2 1/2	10%	....	....	....	....	15/16	10%
10— 13	2 3/4	10%	....	....	....	....	15/16	10%
14— 20	3	....	10%	....	....	....	1 3/16	5%
21— 30	3 1/2	....	10%	....	....	....	1 7/16	5%
31— 42	4	....	5%	....	....	....	1 15/16	5%
43— 54	4 1/2	....	5%	....	....	....	2 3/16	5%
55— 66	5	....	....	5%	....	....	2 7/16	5%
67— 78	6	....	....	5%	....	....	2 11/16	5%
79— 90	7	....	....	....	5%	....	2 15/16	5%
91—102	8	....	....	....	5%	....	3 7/16	5%
103—120	9	....	....	....	....	5%	3 7/16	5%

CAST IRON PULLEYS

FOR SINGLE BELT

Machine molded, bored accurately to shaft size, turned and balanced carefully.

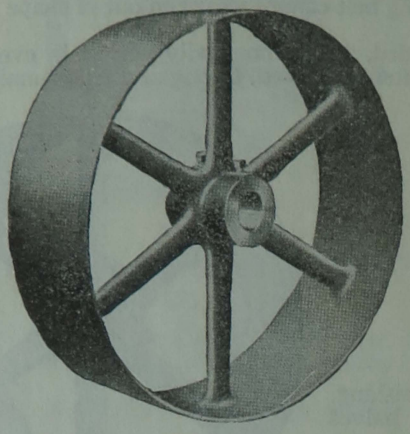


Fig. 1787

SOLID—NO. T-409

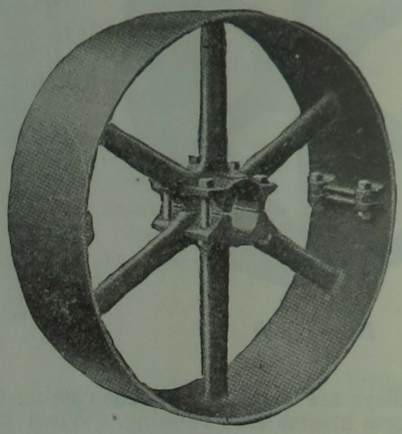


Fig. 1788

SPLIT—NO. T-410

Diam. Inches	Face in Inches								Diam. Inches	Face in Inches							
	3 Each	4 Each	5 Each	6 Each	7 Each	8 Each	9 Each	10 Each		3 Each	4 Each	5 Each	6 Each	7 Each	8 Each	9 Each	10 Each
6	$2.20	$2.50	$2.85	$3.20	$3.60	$4.05	...	...	6	$3.70	$4.00	$4.60	$4.95	$5.60	$6.05	...	...
7	2.40	2.75	3.10	3.50	3.95	4.40	...	...	7	3.90	4.25	4.85	5.25	5.95	6.40	...	...
8	2.65	3.00	3.40	3.80	4.25	4.75	...	...	8	4.25	4.60	5.30	5.70	6.45	6.95	...	...
9	2.90	3.25	3.65	4.10	4.60	5.10	...	...	9	4.50	4.85	5.55	6.00	6.80	7.30	...	...
10	3.10	3.50	3.95	4.40	4.90	5.45	...	...	10	4.80	5.20	6.00	6.45	7.30	7.85	...	...
11	3.30	3.75	4.20	4.70	5.25	5.85	...	...	11	5.00	5.45	6.25	6.75	7.65	8.25	...	...
12	3.60	4.05	4.55	5.10	5.70	6.30	...	...	12	5.40	5.85	6.75	7.30	8.30	8.90	...	...
13	3.90	4.35	4.90	5.50	6.10	6.75	$7.45	...	13	5.45	6.15	7.10	7.70	8.70	9.35	10.50	...
14	4.05	4.65	5.10	5.75	6.45	7.20	7.95	...	14	6.00	6.60	7.50	8.15	9.30	9.95	11.30	...
15	4.35	4.85	5.65	6.10	6.85	7.70	8.60	...	15	6.30	6.80	8.05	8.50	9.70	10.55	11.95	...
16	4.65	5.20	5.80	6.50	7.30	8.20	9.20	...	16	6.75	7.30	8.40	9.10	10.40	11.30	12.85	...
17	4.90	5.50	6.25	7.00	7.85	8.75	9.75	...	17	7.00	7.60	8.85	9.60	10.95	11.95	13.40	...
18	5.20	5.85	6.60	7.40	8.30	9.30	10.40	...	18	7.45	8.05	9.40	10.20	11.70	12.65	14.35	...
19	5.45	6.25	7.05	7.90	8.85	9.85	10.95	...	19	7.70	8.50	9.85	10.70	12.20	13.20	14.90	...
20	5.75	6.65	7.55	8.50	9.45	10.45	11.55	12.70	20	8.20	9.10	10.60	11.55	13.10	14.10	15.85	17.00
21	6.05	7.00	8.00	9.00	10.00	11.00	12.10	13.25	21	8.50	9.45	11.05	12.05	13.65	14.65	16.40	17.55
22	6.35	7.40	8.45	9.50	10.55	11.55	12.65	13.85	22	9.00	10.05	11.75	12.80	14.50	15.50	17.30	18.50
23	6.70	7.80	8.90	10.00	11.10	12.15	13.30	14.45	23	9.35	10.45	12.20	13.30	15.05	16.10	17.95	19.10
24	7.05	8.20	9.35	10.50	11.65	12.80	14.00	15.20	24	9.85	11.00	12.90	14.05	15.90	17.05	19.00	20.20
25	7.40	8.60	9.80	11.00	12.20	13.40	14.65	15.90	25	10.20	11.40	13.35	14.55	16.45	17.65	19.65	20.90
26	7.75	9.00	10.25	11.50	12.75	14.05	15.35	16.70	26	10.75	12.00	14.10	15.35	17.35	18.65	20.75	22.10
27	8.15	9.50	10.80	12.10	13.45	14.80	16.20	17.65	27	11.15	12.50	14.65	15.95	18.05	19.40	21.60	23.05
28	8.55	9.95	11.35	12.75	14.15	15.55	17.00	18.50	28	11.80	13.20	15.50	16.90	19.10	20.50	22.80	24.30
29	9.00	10.50	12.00	13.45	14.90	16.35	17.95	19.45	29	12.25	13.75	16.15	17.60	19.85	21.30	24.75	25.25
30	9.40	10.90	12.45	14.00	15.85	17.15	18.75	20.35	30	12.90	14.40	16.90	18.45	21.15	22.45	24.95	26.55
31	9.85	11.40	12.95	14.55	16.15	17.80	19.50	21.25	31	13.35	14.90	17.40	19.00	21.45	23.10	25.70	27.45
32	10.30	11.90	13.55	15.20	16.90	18.60	20.35	22.15	32	14.10	15.70	18.35	20.00	22.60	24.30	27.00	28.80
33	10.80	12.40	14.10	15.85	17.65	19.45	21.30	23.15	33	14.60	16.20	18.90	20.65	23.25	26.10	27.95	29.80
34	11.35	12.95	14.70	16.50	18.40	20.30	22.20	24.15	34	15.45	17.05	19.85	21.65	24.50	26.40	29.30	31.25
35	11.85	13.50	15.30	17.15	19.10	21.20	23.10	25.15	35	15.95	17.60	20.45	22.30	25.20	27.30	30.20	32.25
36	12.40	14.20	16.05	18.00	20.05	22.10	24.15	26.20	36	16.80	18.60	21.55	23.50	26.55	28.60	31.70	33.75
37	...	14.90	16.90	18.95	21.00	23.10	25.20	27.30	37	...	19.30	22.40	24.45	27.50	29.60	32.75	34.85
38	...	15.65	17.70	19.80	21.95	24.10	26.25	28.40	38	...	20.40	23.65	25.70	28.90	31.05	34.30	36.45
39	...	16.20	18.35	20.50	22.70	24.90	27.10	29.35	39	...	20.95	24.25	26.40	29.65	31.85	35.15	37.40
40	...	16.75	18.95	21.15	23.40	25.70	28.00	30.30	40	...	21.85	25.25	27.45	30.80	33.10	36.55	38.85
41	...	17.30	19.55	21.85	24.20	26.55	28.90	31.25	41	...	22.40	25.85	28.15	31.60	33.95	37.45	39.80
42	...	17.90	20.20	22.60	25.00	27.40	29.80	32.20	42	...	23.35	26.90	29.30	32.85	35.25	38.85	41.25
43	...	18.60	21.00	23.40	25.85	28.30	30.75	33.20	43	...	24.05	27.70	30.10	33.70	36.15	39.80	42.25
44	...	19.30	21.75	24.20	26.70	29.25	31.80	34.30	44	...	25.15	28.90	31.35	35.05	37.60	41.40	43.90
45	...	20.00	22.50	25.05	27.60	30.20	32.80	35.40	45	...	25.85	29.65	32.20	35.95	38.55	42.40	45.00
46	...	20.80	23.35	25.95	28.55	31.20	33.85	36.50	46	...	27.05	30.95	33.55	37.40	40.05	44.00	46.65
47	...	21.60	24.20	26.85	29.50	32.20	34.90	37.60	47	...	27.85	31.80	34.45	38.35	41.05	45.05	47.75
48	...	22.40	25.05	27.75	30.45	33.20	35.95	38.75	48	...	29.05	33.10	35.80	39.80	42.55	46.65	49.45

List prices of single belt pulleys include keyseat or set screw. If both are required, there will be an extra charge as per list on a following page.

SINGLE ARM CAST IRON PULLEYS

SOLID—FOR DOUBLE BELT

Diam. Ins.	Face in Inches																	
	3 Each	4 Each	5 Each	6 Each	7 Each	8 Each	9 Each	10 Each	11 Each	12 Each	13 Each	14 Each	15 Each	16 Each	18 Each	20 Each	22 Each	24 Each
6	$2.50	$2.80	$3.15	$3.60	$4.10	$4.55	$5.05	$5.55	$6.05	$6.55	....	....	....	....	....	....	....	....
7	2.70	3.05	3.50	3.95	4.40	4.90	5.35	5.85	6.35	6.85	....	....	....	....	....	....	....	....
8	2.90	3.35	3.80	4.25	4.75	5.25	5.80	6.35	6.95	7.60	....	....	....	....	....	....	....	....
9	3.20	3.65	4.15	4.65	5.20	5.75	6.30	6.90	7.50	8.15	....	....	....	....	....	....	....	....
10	3.45	3.95	4.45	5.00	5.55	6.15	6.80	7.50	8.20	8.95	....	....	....	....	....	....	....	....
11	3.70	4.25	4.80	5.40	6.00	6.65	7.30	8.00	8.75	9.55	$10.40	....	....	....	....	....	....	....
12	3.95	4.55	5.15	5.80	6.45	7.15	7.85	8.60	9.35	10.15	10.95	$11.75	$12.60	....	....	....	....	....
13	4.20	4.85	5.50	6.20	6.90	7.65	8.40	9.20	10.00	10.85	11.70	12.60	13.50	....	....	....	....	....
14	4.50	5.20	5.95	6.70	7.50	8.30	9.10	9.95	10.80	11.70	12.60	13.50	14.45	....	....	....	....	....
15	4.80	5.55	6.35	7.15	8.00	8.85	9.75	10.65	11.60	12.55	13.50	14.50	15.50	....	....	....	....	....
16	5.10	5.80	6.60	7.45	8.50	9.20	10.10	11.05	12.00	13.00	14.00	15.00	16.05	$17.20	....	....	....	....
17	5.40	6.25	7.10	8.00	8.90	9.85	10.80	11.80	12.80	13.85	14.90	16.00	17.10	18.25	....	....	....	....
18	5.70	6.65	7.60	8.55	9.55	10.55	11.60	12.65	13.75	14.85	15.90	17.05	18.25	19.45	....	....	....	....
19	6.05	7.05	8.10	9.15	10.25	11.35	12.40	13.55	14.70	15.90	17.10	18.35	19.60	20.90	$23.55	....	....	....
20	6.40	7.45	8.55	9.65	10.80	11.95	13.15	14.35	15.60	16.85	18.15	19.45	20.80	22.15	24.95	....	....	....
21	6.75	7.85	9.00	10.15	11.35	12.55	13.80	15.05	16.35	17.65	19.00	20.35	21.75	23.15	26.05	....	....	....
22	7.10	8.30	9.50	10.75	12.00	13.30	14.60	15.95	17.30	18.70	20.10	21.55	23.00	24.50	27.55	$30.70	....	....
23	7.50	8.75	10.05	11.35	12.70	14.05	15.45	16.85	18.30	19.75	21.25	22.75	24.30	25.85	29.05	32.35	....	....
24	7.90	9.25	10.60	12.00	13.40	14.85	16.30	17.80	19.30	20.85	22.40	24.00	25.60	27.25	30.60	34.05	....	....
25	8.35	9.75	11.20	12.65	14.15	15.65	17.20	18.75	20.35	21.95	23.60	25.25	26.95	28.65	32.15	35.75	$39.45	....
26	8.80	10.30	11.80	13.35	14.90	16.50	18.10	19.75	21.40	23.10	24.80	26.55	28.30	30.10	33.75	37.50	41.35	....
27	9.30	10.85	12.45	14.05	15.70	17.35	19.05	20.75	22.50	24.25	26.05	27.85	29.70	31.55	35.35	39.25	43.25	....
28	9.80	11.45	13.10	14.80	16.50	18.25	20.00	21.80	23.60	25.45	27.80	29.20	31.10	33.05	36.90	40.95	45.10	....
29	10.30	12.00	13.75	15.50	17.30	19.10	20.95	22.80	24.70	26.60	28.55	30.50	32.50	34.50	38.60	42.80	47.10	....
30	10.85	12.65	14.45	16.30	18.15	20.05	21.95	23.90	25.85	27.85	29.85	31.90	33.95	36.00	40.25	44.60	49.05	....
31	11.40	13.25	15.15	17.05	19.00	20.95	22.95	24.95	27.00	29.05	31.15	33.25	35.40	37.55	41.95	46.45	51.10	....
32	11.95	13.90	15.85	17.85	19.85	21.90	23.95	26.05	28.15	30.30	32.50	34.70	36.95	39.20	43.80	48.50	53.30	....
33	12.50	14.50	16.55	18.60	20.70	22.80	24.95	27.10	29.30	31.55	33.80	36.10	38.40	40.75	45.50	50.35	55.30	$60.35
34	13.10	15.20	17.30	19.45	21.60	23.80	26.05	28.30	30.60	32.90	35.25	37.60	40.00	42.40	47.30	52.30	57.40	62.65
35	13.70	15.90	18.10	20.35	22.60	24.90	27.20	29.55	31.90	34.30	36.70	39.15	41.60	44.10	49.15	54.30	59.60	65.00
36	14.30	16.55	18.85	21.15	23.50	25.85	28.25	30.70	33.15	35.65	38.15	40.70	43.25	45.85	51.10	56.45	61.90	67.40
37	....	17.25	19.65	22.05	24.50	26.95	29.45	31.95	34.50	37.05	39.65	42.25	44.90	47.55	52.95	58.45	64.10	69.85
38	....	18.00	20.50	23.00	25.55	28.10	30.70	33.30	35.95	38.60	41.30	44.00	46.75	49.50	55.10	60.80	66.55	72.35
39	....	18.75	21.30	23.85	26.40	29.00	31.60	34.25	36.80	39.60	42.30	45.05	47.80	50.60	56.25	62.00	67.85	73.80
40	....	19.50	22.15	24.80	27.45	30.10	32.80	35.50	38.20	40.95	43.70	46.45	49.25	52.05	57.75	63.50	69.35	75.35
41	....	20.25	23.00	25.65	28.40	31.15	33.90	36.65	39.45	42.25	45.05	47.85	50.70	53.55	59.25	65.05	70.90	76.80
42	....	21.05	23.85	26.65	29.45	32.25	35.10	37.95	40.80	43.70	46.60	49.50	52.45	55.40	61.35	67.35	73.35	79.40
43	....	21.85	24.75	27.65	30.55	33.45	36.40	39.35	42.30	45.25	48.25	51.25	54.25	57.25	63.35	69.50	75.75	82.05
44	....	22.65	25.65	28.65	31.65	34.65	37.70	40.75	43.80	46.85	49.95	53.05	56.15	59.25	65.55	71.80	78.25	84.75
45	....	23.50	26.55	29.60	32.65	35.75	38.85	41.95	45.10	48.25	51.40	54.60	57.80	61.00	67.50	74.05	80.70	87.50
46	....	24.35	27.50	30.65	33.85	37.05	40.25	43.45	46.70	49.95	53.20	56.50	59.80	63.10	69.80	76.55	83.40	90.30
47	....	25.20	28.45	31.70	34.95	38.20	41.50	44.80	48.10	51.45	54.80	58.15	61.55	64.95	71.85	78.85	85.95	93.10
48	....	26.10	29.40	32.75	36.10	39.45	42.85	46.25	49.65	53.10	56.55	60.00	63.50	67.00	74.10	81.30	88.60	95.95
50	....	27.90	31.40	34.90	38.40	41.95	45.50	49.10	52.70	56.35	60.00	63.70	67.40	71.15	78.70	86.35	94.15	102.05
52	....	29.80	33.50	37.25	41.00	44.75	48.55	52.35	56.20	60.05	63.95	67.85	71.80	75.75	83.75	91.85	100.00	108.20
54	....	31.75	35.65	39.60	43.55	47.55	51.55	55.60	59.65	63.75	67.85	72.00	76.15	80.35	88.80	97.35	106.00	114.70
56	....	33.80	37.90	42.05	46.20	50.40	54.65	58.95	63.25	67.50	71.85	76.25	80.65	85.10	94.05	103.10	112.25	121.45
58	....	35.95	40.25	44.60	49.00	53.45	57.95	62.45	67.00	71.55	76.15	80.75	85.40	90.05	99.45	108.95	118.60	128.45
60	....	38.20	42.65	47.25	51.85	56.50	61.20	65.90	70.65	75.45	80.30	85.15	90.05	95.00	105.05	115.20	125.55	136.00
62	....	....	....	49.85	54.60	59.40	64.25	69.15	74.10	79.10	84.15	89.25	94.40	99.60	110.15	120.90	131.85	142.95
64	....	....	....	52.65	57.50	62.40	67.35	72.35	77.40	82.50	87.65	92.85	98.10	103.40	114.15	125.10	136.30	147.90
66	....	....	....	55.55	60.50	65.50	70.55	75.65	80.80	86.00	91.25	96.55	101.90	107.30	118.25	129.45	141.05	152.95
68	....	....	....	58.55	63.60	68.70	73.85	79.05	84.30	89.60	94.95	100.35	105.80	111.30	122.50	133.95	145.75	157.95
70	....	....	....	61.50	66.70	71.95	77.85	82.65	88.10	93.60	99.15	104.75	110.40	116.10	127.75	139.75	152.15	164.90
72	....	....	....	64.55	69.90	75.30	80.75	86.25	91.80	97.40	103.10	108.85	114.70	120.65	132.85	145.45	158.45	171.95
74	....	....	....	....	....	78.75	84.35	90.05	95.80	101.60	107.50	113.50	119.60	125.80	138.50	151.60	165.20	179.20
76	....	....	....	....	....	82.30	88.05	93.90	99.85	105.90	112.05	118.30	124.65	131.10	144.30	158.00	172.10	186.60
78	....	....	....	....	....	85.95	91.90	97.95	104.10	110.40	116.80	123.30	129.90	136.60	150.40	164.60	179.20	194.20
80	....	....	....	....	....	89.70	95.90	102.20	108.60	115.15	121.80	128.55	135.40	142.35	156.60	171.30	186.40	202.10
82	....	....	....	....	....	93.55	100.00	106.55	113.20	120.00	126.90	133.90	141.05	148.30	163.15	178.45	194.25	210.40
84	....	....	....	....	....	97.50	104.20	111.00	117.90	124.95	132.10	139.40	146.80	154.35	169.80	185.75	202.20	219.00
86	....	....	....	....	....	101.55	108.50	115.60	122.80	130.15	137.60	145.20	152.90	160.75	176.80	193.35	210.35	227.80
88	....	....	....	....	....	105.70	112.95	120.30	127.80	135.45	143.20	151.05	159.05	167.20	183.80	200.95	218.55	236.70
90	....	....	....	....	....	109.95	117.55	125.25	133.05	141.00	149.05	157.20	165.50	173.90	191.05	208.70	227.00	245.70
92	....	....	....	....	....	114.30	122.30	130.35	138.50	147.60	155.75	163.65	172.25	181.00	198.70	216.90	235.60	254.80
94	....	....	....	....	....	118.75	127.10	135.50	144.00	152.60	161.30	170.10	179.00	188.00	206.40	225.20	244.40	264.00
96	....	....	....	....	....	123.30	132.05	140.85	149.75	158.70	167.70	176.80	186.00	195.30	214.20	233.50	253.20	273.30
98	....	....	....	....	....	127.95	137.10	146.30	155.60	164.95	174.35	183.85	193.40	203.00	222.35	242.05	262.15	282.70
100	....	....	....	....	....	131.45	140.80	150.20	159.70	169.25	178.90	188.55	198.30	208.10	227.80	247.80	268.15	288.70
102	....	....	....	....	....	134.95	144.50	154.10	163.75	173.45	183.20	193.05	202.95	212.90	233.05	253.40	273.95	294.70
104	....	....	....	....	....	138.45	148.20	158.00	167.85	177.75	187.70	197.70	207.75	217.85	238.20	258.80	279.65	300.70
106	....	....	....	....	....	142.60	152.55	162.55	172.65	182.80	193.00	203.30	213.65	224.05	245.10	266.40	287.85	309.70
108	....	....	....	....	....	147.60	157.75	167.95	178.25	188.60	199.05	209.55	220.15	230.80	252.35	274.70	296.40	318.80
110	....	....	....	....	....	152.70	163.05	173.45	183.95	194.55	205.20	215.95	226.80	237.70	259.80	282.20	304.95	328.00
112	....	....	....	....	....	157.90	168.50	179.20	190.00	200.85	211.80	222.85	233.95	245.15	267.70	290.60	313.80	337.30
114	....	....	....	....	....	163.20	174.05	185.00	196.05	207.15	218.35	229.65	241.00	252.45	275.50	298.90	322.60	346.70
116	....	....	....	....	....	168.60	179.70	190.90	202.20	213.55	225.00	236.55	248.15	259.85	283.50	307.45	331.65	356.20
118	....	....	....	....	....	174.10	185.50	196.95	208.45	220.05	231.75	243.50	255.30	267.20	291.30	315.80	340.60	365.80
120	....	....	....	....	....	179.80	191.40	203.05	214.80	226.60	238.50	250.45	262.50	274.65	299.25	324.25	349.65	375.50

List prices of double belt pulleys include both keyseat and set screw.

SINGLE ARM CAST IRON PULLEYS

SPLIT—FOR DOUBLE BELT

Diam Ins.	Face in Inches																	
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	18	20	22	24
	)Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
6	$4.00	$4.30	$4.90	$5.35	$6.10	$6.55	$7.35	$7.85	$8.65	$9.15	....	....	....	....	....	....	....	....
7	4.20	4.55	5.25	5.70	6.40	6.90	7.65	8.15	8.95	9.50	....	....	....	....	....	....	....	....
8	4.50	4.95	5.70	6.15	6.95	7.45	8.35	8.90	9.85	10.50	....	....	....	....	....	....	....	....
9	4.80	5.25	6.05	6.55	7.40	7.95	8.85	9.45	10.40	11.05	....	....	....	....	....	....	....	....
10	5.15	5.65	6.50	7.05	7.95	8.55	9.60	10.30	11.40	12.15	....	....	....	....	....	....	....	....
11	5.40	5.95	6.85	7.65	8.40	9.05	10.10	10.80	11.95	12.75	$14.05	....	....	....	....	....	....	....
12	5.75	6.40	7.35	8.00	9.05	9.75	10.90	11.65	12.85	13.65	14.95	$15.75	$17.10	....	....	....	....	....
13	6.00	6.65	7.70	8.40	9.50	10.25	11.45	12.25	13.50	14.35	15.70	16.60	18.00	....	....	....	....	....
14	6.45	7.15	8.35	9.10	10.35	11.15	12.45	13.30	14.65	15.55	17.00	17.90	19.40	....	....	....	....	....
15	6.75	7.50	8.75	9.55	10.85	11.70	13.10	14.00	15.45	16.40	17.90	18.90	20.45	....	....	....	....	....
16	7.20	7.90	9.20	10.05	11.60	12.30	13.75	14.70	16.20	17.20	18.80	19.80	21.45	$22.65	....	....	....	....
17	7.50	8.35	9.70	10.60	12.00	12.95	14.45	15.50	17.00	18.05	19.70	20.80	22.50	23.65	....	....	....	....
18	7.95	8.90	10.40	11.35	12.90	13.90	15.55	16.60	18.30	19.40	21.10	22.25	24.10	25.30	....	....	....	....
19	8.30	9.30	10.95	11.95	13.60	14.70	16.35	17.50	19.25	20.45	22.20	23.55	25.45	26.75	$30.10	....	....	....
20	8.85	9.90	11.60	12.70	14.45	15.60	17.45	18.65	20.55	21.80	23.80	25.10	27.15	28.50	32.05	....	....	....
21	9.20	10.30	12.05	13.20	15.00	16.20	18.10	19.35	21.30	22.60	24.65	26.00	28.10	29.50	33.15	....	....	....
22	9.75	10.95	12.80	14.05	15.95	17.25	19.25	20.60	22.65	24.05	26.20	27.65	29.85	31.35	35.20	$39.15	....	....
23	10.15	11.40	13.35	14.65	16.65	18.00	20.10	21.50	23.65	25.10	27.35	28.85	31.15	32.70	36.70	40.80	....	....
24	10.70	12.05	14.15	15.55	17.65	19.10	21.30	22.80	25.05	26.60	28.95	30.55	32.95	34.60	38.80	43.10	....	....
25	11.15	12.55	14.75	16.20	18.40	19.90	22.20	23.75	26.10	27.70	30.15	31.80	34.30	36.00	40.35	44.80	$49.40	....
26	11.80	13.30	15.65	17.20	19.50	21.10	23.50	25.15	27.60	29.30	31.85	33.60	36.20	38.00	42.55	47.20	52.00	....
27	12.30	13.85	16.30	17.90	20.30	21.95	24.45	26.15	28.70	30.45	33.10	34.90	37.60	39.45	44.15	48.95	53.90	....
28	13.05	14.65	17.25	18.95	21.45	23.20	25.80	27.60	30.25	32.10	35.35	36.75	39.55	41.50	46.30	51.30	56.45	....
29	13.55	15.25	17.90	19.65	22.25	24.05	26.75	28.60	31.35	33.25	36.10	38.05	40.95	42.95	48.00	53.15	58.45	....
30	14.35	16.15	18.90	20.75	23.45	25.35	28.15	30.10	32.95	34.95	37.90	39.95	42.95	45.00	50.25	55.60	61.10	....
31	14.90	16.75	19.60	21.50	24.30	26.25	29.15	31.15	34.10	36.15	39.20	41.30	44.40	46.55	51.95	57.45	63.15	....
32	15.75	17.70	20.65	22.65	25.55	27.60	30.60	32.70	35.75	37.90	41.10	43.30	46.55	48.80	54.45	60.20	66.10	....
33	16.30	18.30	21.35	23.40	26.30	29.45	31.60	33.75	36.90	39.20	42.40	44.70	48.00	50.35	56.15	62.05	68.10	$74.25
34	17.20	19.30	22.45	24.60	27.70	29.90	33.15	35.40	38.70	41.00	44.40	46.75	50.20	52.60	59.60	64.70	70.95	77.35
35	17.80	20.00	23.25	25.50	28.70	31.00	34.30	36.65	40.00	42.40	45.85	48.30	51.80	54.30	60.55	66.70	73.15	79.70
36	18.70	20.95	24.40	26.65	30.00	32.35	35.80	38.25	41.75	44.25	47.85	50.40	54.05	56.65	63.05	69.55	76.20	82.90
37	....	21.65	25.15	27.55	31.00	33.45	37.00	39.50	43.10	45.65	49.35	51.95	55.70	58.35	64.85	71.55	78.40	85.35
38	....	22.75	26.45	28.90	32.50	35.05	38.75	41.35	45.10	47.75	51.60	54.30	58.20	60.95	67.75	74.65	81.65	88.70
39	....	23.50	27.20	29.75	33.35	35.95	39.65	42.30	45.95	48.75	52.60	55.35	59.25	62.05	68.90	75.85	82.95	90.15
40	....	24.60	28.45	31.10	34.85	37.50	41.35	42.05	47.90	50.65	54.60	57.35	61.35	64.15	71.10	78.10	85.25	92.55
41	....	25.35	29.30	31.95	35.80	38.55	42.45	45.20	49.15	51.95	55.95	58.75	62.80	65.65	72.60	79.65	86.80	94.00
42	....	26.50	30.55	33.35	37.30	40.10	44.15	47.00	51.00	53.95	57.80	60.70	65.20	68.15	75.40	82.70	90.05	97.45
43	....	27.30	31.45	34.35	38.40	41.30	45.45	48.40	52.55	55.50	59.45	62.45	67.00	70.00	77.40	84.85	92.45	100.10
44	....	28.50	32.80	35.80	40.00	43.00	47.30	50.30	54.65	57.70	61.80	64.90	69.60	72.70	80.35	87.95	95.80	103.70
45	....	29.35	33.70	36.75	41.00	44.10	48.45	51.55	55.95	59.10	63.25	66.45	71.25	74.45	82.30	90.20	98.25	106.45
46	....	30.60	35.10	38.25	42.70	45.90	50.40	53.60	58.15	61.40	65.70	69.00	73.95	77.25	87.75	93.50	101.80	110.15
47	....	31.45	36.05	39.30	43.80	47.05	51.65	54.95	59.55	62.90	67.30	70.65	75.70	79.10	87.40	95.80	104.35	112.95
48	....	32.75	37.45	40.80	45.45	48.80	53.55	57.95	61.70	65.15	69.70	73.15	78.35	81.85	90.40	99.05	107.85	116.70
50	....	35.00	39.95	43.45	48.30	51.85	56.80	60.40	65.40	69.05	73.85	77.55	83.00	86.75	95.80	104.95	116.30	123.75
52	....	37.35	42.55	46.30	51.45	55.20	60.45	64.25	69.55	73.40	78.50	82.40	88.15	92.10	101.65	111.30	121.05	130.80
54	....	39.75	45.20	49.15	54.55	58.55	64.05	68.10	73.65	77.75	83.10	87.25	93.25	97.45	107.50	117.65	127.95	138.30
56	....	42.30	48.00	52.15	57.80	62.00	67.80	72.10	77.95	82.20	87.85	92.25	98.55	103.00	113.60	124.30	135.15	146.05
58	....	44.95	50.90	55.25	61.20	65.65	71.75	76.25	82.40	86.95	92.90	97.50	104.10	108.75	119.85	131.05	142.45	154.05
60	....	47.70	53.85	58.45	64.65	69.30	75.65	80.35	86.75	91.55	97.80	102.65	109.55	114.50	126.30	138.20	150.35	162.60
62	....	....	....	61.65	68.05	72.85	79.40	84.30	90.95	95.95	102.45	107.55	114.75	119.95	132.30	144.85	157.65	170.60
64	....	....	....	65.05	71.60	76.50	83.20	88.20	95.00	100.10	106.75	111.95	119.30	124.60	137.20	150.00	163.10	176.60
66	....	....	....	68.55	75.25	80.25	87.10	92.20	99.15	104.35	111.15	116.45	123.95	129.35	142.20	155.30	168.85	182.70
68	....	....	....	72.20	79.05	84.15	91.15	96.35	103.45	108.07	115.70	121.10	128.75	134.25	147.40	160.80	174.60	188.80
70	....	....	....	75.80	82.85	88.10	95.30	100.70	108.05	113.55	120.75	126.35	134.25	139.95	153.60	167.60	182.05	196.85
72	....	....	....	79.50	86.75	92.15	99.55	105.05	112.55	118.15	125.55	131.30	139.45	145.40	159.65	174.30	189.40	205.00
74	....	....	....	....	....	96.35	103.95	109.65	117.40	123.20	130.85	136.85	145.30	151.50	166.30	181.50	197.25	213.40
76	....	....	....	....	....	100.65	108.45	114.30	122.30	128.35	136.30	142.55	151.30	157.75	173.10	188.95	205.25	221.95
78	....	....	....	....	....	105.05	113.10	119.15	127.40	133.70	141.95	148.45	157.50	164.20	180.20	196.60	213.45	230.70
80	....	....	....	....	....	109.60	117.95	124.25	132.80	139.35	147.90	154.65	164.00	170.95	187.45	204.40	221.80	239.80
82	....	....	....	....	....	114.25	122.90	129.45	138.30	145.10	153.95	160.95	170.65	177.90	195.05	212.65	230.80	249.30
84	....	....	....	....	....	119.00	127.95	134.75	143.90	150.95	160.10	167.40	177.40	184.95	202.75	221.05	239.90	259.10
86	....	....	....	....	....	123.90	133.15	140.25	149.75	157.10	166.60	174.20	184.55	192.40	210.85	229.80	249.25	269.15
88	....	....	....	....	....	128.90	138.50	145.85	155.70	163.35	173.20	181.05	191.75	199.90	218.95	238.55	258.65	279.30
90	....	....	....	....	....	134.00	144.00	151.70	161.90	169.85	180.05	188.20	199.25	207.65	227.30	247.45	268.30	289.55
92	....	....	....	....	....	139.25	149.70	157.75	168.35	176.55	187.80	195.70	207.10	215.85	236.10	256.85	278.15	299.95
94	....	....	....	....	....	144.60	155.45	163.85	174.85	183.45	194.40	203.20	214.95	223.95	244.95	266.35	288.20	310.45
96	....	....	....	....	....	150.05	161.35	170.15	181.60	190.55	201.85	210.95	223.05	232.35	253.90	275.85	298.25	321.05
98	....	....	....	....	....	155.65	167.40	176.60	188.50	197.85	209.60	219.10	231.60	241.20	263.25	285.65	308.50	331.80
100	....	....	....	....	....	160.10	172.10	181.50	193.65	203.20	215.25	224.90	237.65	247.45	269.90	292.65	315.80	339.15
102	....	....	....	....	....	164.55	176.80	186.40	198.75	208.45	220.65	230.50	243.45	253.40	276.35	299.50	322.90	346.50
104	....	....	....	....	....	169.05	181.55	191.35	203.95	213.85	226.30	236.30	249.45	259.55	282.75	306.20	329.95	353.90
106	....	....	....	....	....	174.20	186.95	196.95	209.85	220.00	232.75	243.05	256.55	266.95	290.90	315.10	339.50	364.30
108	....	....	....	....	....	180.20	193.20	203.40	216.55	226.90	239.95	250.45	264.25	274.90	299.40	324.70	349.40	374.80
110	....	....	....	....	....	186.35	199.60	210.00	223.40	234.00	247.30	258.05	272.15	283.05	308.15	333.55	359.35	385.45
112	....	....	....	....	....	192.60	206.15	216.85	230.60	241.45	255.10	266.15	280.55	291.75	317.35	343.30	369.60	396.20
114	....	....	....	....	....	198.95	212.80	223.75	235.80	248.90	262.85	274.15	288.85	300.30	326.45	352.95	379.80	407.05
116	....	....	....	....	....	205.45	219.60	230.80	245.15	256.50	270.75	282.30	297.30	309.00	335.80	362.90	390.30	418.05
118	....	....	....	....	....	212.05	226.55	238.00	252.60	264.20	278.75	290.50	305.75	317.65	344.95	372.65	400.70	429.15
120	....	....	....	....	....	218.85	233.60	245.25	260.15	271.95	286.75	298.70	314.25	326.40	354.25	382.50	411.20	440.35

List prices of double belt pulleys include both keyseat and set screw.

DOUBLE ARM CAST IRON PULLEYS

SOLID—FOR DOUBLE BELT

Diam. Ins.	Face in Inches										
	20	22	24	26	28	30	32	34	36	38	40
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
20	$31.60	$34.35	$37.15	$40.00	$42.90	.....	.....	.....	.....	.....	.....
21	33.10	35.95	38.85	41.90	44.90	.....	.....	.....	.....	.....	.....
22	35.10	38.05	41.15	44.25	47.40	$50.60	.....	.....	.....	.....	.....
23	37.10	40.25	43.45	46.70	50.00	53.35	.....	.....	.....	.....	.....
24	39.20	42.45	45.85	49.30	52.80	56.35	.....	.....	.....	.....	.....
25	41.25	44.75	48.30	51.90	55.55	59.25	.....	.....	.....	.....	.....
26	43.45	47.10	50.80	54.55	58.35	62.20	.....	.....	.....	.....	.....
27	45.65	49.50	53.35	57.30	61 20	65.20	.....	.....	.....	.....	.....
28	47.95	51.90	56.00	60.05	64.25	68.45	$72.70	.....	.....	.....	.....
29	50.15	54.35	58.50	62.80	67.10	71.45	75.85	.....	.....	.....	.....
30	52.60	56.85	61.25	65.65	70.15	74.70	79.25	$83.90	.....	.....	.....
31	54.90	59.40	63.90	68.55	73.15	77.85	82.60	87.40	.....	.....	.....
32	57.30	62.05	66.65	71.50	76.35	81.25	86.20	91.20	.....	.....	.....
33	59.60	64.45	69.40	74.35	79.40	84.45	89.55	94.70	.....	.....	.....
34	62.25	67.30	72.40	77.55	82.70	87.90	93.15	98.45	$103.85	.....	.....
35	65.00	70.20	75.45	80.75	86.15	91.55	97.00	102.50	108.10	.....	.....
36	67.55	72.95	78.45	83.95	89.55	95.15	100.80	106.50	112.30	.....	.....
37	70.30	75.90	81.50	87.25	92.95	98.70	104.50	110.35	116.30	.....	.....
38	73.25	79.10	84.90	90.85	96.80	102.80	108.85	114.95	121.10	$127.35	.....
39	75.35	80.95	87.10	93.05	99.10	105.20	111.35	117.55	123.80	130.10	.....
40	78.10	84.05	90.10	96.15	102.20	108.30	114.45	120.65	126.90	133.25	.....
41	80.65	86.80	92.95	99.10	105.25	111.40	117.65	123.95	130.30	136.70	.....
42	83.50	89.75	96.15	102.50	108.90	115.30	121.75	128.25	134.80	141.45	$148.15
43	86.55	93.05	99.55	106.15	112.75	119.30	125.95	132.65	139.35	146.10	152.90
44	89.65	96.35	103.05	109.90	116.70	123.50	130.35	137.20	144.10	151.00	157.95
45	92.30	99.20	106.15	113.10	120.10	127.10	134.15	141.25	148.40	155.60	162.90
46	95.60	102.75	109.90	117.05	124.30	131.45	138.65	145.85	153.05	160.25	167.40
47	98.80	105.80	113.20	120.55	127.95	135.40	142.90	150.45	158.05	165.70	173.45
48	101.75	109.25	116.80	124.40	132.00	139.65	147.35	155.15	163.00	170.90	178.85
50	.....	115.95	121.95	132.00	140.15	148.35	156.60	164.85	183.15	181.50	189.95
52	.....	123.65	132.10	140.70	149.25	157.85	166.55	175.35	184.20	193.10	202.05
54	.....	131.25	140.25	149.25	158.40	167.60	176.85	186.10	195.40	204.75	214.15
56	.....	139.15	148.50	158.05	167.75	177.45	187.20	197.00	206.85	216.80	226.80
58	.....	147.40	157.40	167.55	177.65	187.80	198.00	208.25	218.60	229.10	239.70
60	.....	155.45	166.00	176.65	187.35	198.15	209.05	220.00	231.05	242.20	253.45
62	.....	163.00	174.00	185.15	196.35	207.70	219.15	230.70	242.35	254.10	266.00
64	.....	170.30	181.50	192.85	204.25	215.80	227.45	239.20	251.05	263.00	275.20
66	.....	177.75	189.20	200.75	212.40	224.15	236.00	248.00	260.15	272.40	284.80
68	.....	185.45	197.10	208.80	220.75	232.80	244.95	257.20	269.60	282.10	294.70
70	.....	193.80	205.90	218.15	230.45	242.90	255.50	268.25	281.15	294.20	307.45
72	.....	201.95	214.30	226.80	239.45	252.35	265.45	278.75	292.25	306.00	320.00
74	.....	.....	223.50	236.50	249.70	263.10	276.70	290.50	304.60	318.95	333.50
76	.....	.....	233.00	246.50	260.25	274.20	288.40	302.85	317.55	332.50	347.60
78	.....	.....	242.90	256.95	271.25	285.80	300.60	315.60	330.85	346.35	362.10
80	.....	.....	253.35	267.95	282.80	297.85	313.15	328.70	344.50	360.55	376.85
82	.....	.....	264.00	279.20	294.60	310.35	326.30	342.50	358.95	375.65	392.60
84	.....	.....	274.90	290.60	306.70	323.05	339.65	356.50	373.60	391.00	408.65
86	.....	.....	286.35	302.70	319.45	336.45	353.70	371.20	388.95	407.00	425.35
88	.....	.....	298.00	315.05	332.30	349.85	367.70	385.85	404.30	423.05	442.10
90	.....	.....	310.20	327.90	345.85	364.05	382.50	401.20	420.20	439.50	459.75
92	.....	.....	322.85	341.65	360.05	378.95	398.10	417.50	437.15	457.20	477.20
94	.....	.....	335.70	354.85	374.20	393.80	413.65	433.70	454.05	474.65	495.45
96	.....	.....	349.15	363.95	388.95	409.10	429.50	450.20	471.15	492.35	513.70
98	.....	.....	.....	383.55	404.45	425.45	446.45	467.65	489.05	510.65	532.50
100	.....	.....	.....	393.60	414.80	436.10	457.50	479.10	500.90	522.90	545.15
102	.....	.....	.....	403.05	424.70	446.45	468.30	490.30	512.50	534.90	557.50
104	.....	.....	.....	412.95	434.95	457.05	479.25	501.60	524.05	546.60	569.35
106	.....	.....	.....	424.60	447.25	470.05	492.90	516.00	539.20	562.55	586.10
108	.....	.....	.....	437.90	461.00	484.35	507.75	531.40	555.15	579.15	604.35
110	.....	.....	.....	451.45	475.10	498.95	522.95	547.15	571.55	596.10	620.95
112	.....	.....	.....	465.95	490.25	514.70	539.35	564.10	588.95	614.00	641.50
114	.....	.....	.....	480.35	505.25	530.20	555.40	580.70	606.10	631.75	657.60
116	.....	.....	.....	495.00	520.40	545.95	571.65	597.65	623.70	650.00	676.40
118	.....	.....	.....	509.85	535.70	561.65	587.85	614.25	640.85	667.70	694.75
120	.....	.....	.....	524.70	551.00	577.50	604.25	631.20	658.35	686.60	713.35

List prices of double belt pulleys include both keyseat and setscrew.

DOUBLE ARM CAST IRON PULLEYS

SPLIT—FOR DOUBLE BELT

Diam. Ins.	Face in Inches										
	20	22	24	26	28	30	32	34	36	38	40
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
20	$39.45	$43.00	$46.60	$50.30	$54.05	....	....	....	....	....	....
21	40.95	44.60	48.30	52.20	56.05	....	....	....	....	....	....
22	43.40	47.35	51.30	55.30	59.35	$63.50	....	....	....	....	....
23	45.55	49.55	53.60	57.75	61.95	66.25	....	....	....	....	....
24	48.25	52.40	56.70	61.10	65.55	70.10	....	....	....	....	....
25	50.30	54.70	59.15	63.70	68.30	73.00	....	....	....	....	....
26	53.15	57.75	62.40	67.15	71.95	76.85	....	....	....	....	....
27	55.35	60.15	64.95	69.90	74.80	79.85	....	....	....	....	....
28	58.20	63.25	68.35	73.45	78.70	84.00	$89.35	....	....	....	....
29	60.50	65.70	70.85	76.20	81.55	87.00	91.50	....	....	....	....
30	63.60	68.90	74.35	79.85	85.45	91.15	96.85	$102.70	....	....	....
31	65.90	71.45	77.00	82.75	88.45	94.30	100.20	106.20	....	....	....
32	69.00	74.85	80.55	86.55	92.45	98.65	104.80	111.05	....	....	....
33	71.30	77.25	83.30	89.40	95.60	101.85	108.15	114.55	....	....	....
34	74.65	80.85	87.10	93.45	99.80	106.25	112.75	119.35	$126.05	....	....
35	77.40	83.75	90.15	96.65	103.25	109.90	116.60	123.40	130.30	....	....
36	80.65	87.25	93.95	100.70	107.55	114.45	121.40	128.45	135.60	....	....
37	83.40	90.20	97.00	104.00	110.95	118.00	125.10	132.30	139.60	....	....
38	87.05	94.20	101.25	108.50	115.75	123.10	130.50	138.00	145.55	$153.15	....
39	89.20	96.05	103.45	110.70	118.05	125.50	133.00	140.60	148.25	155.90	....
40	92.70	99.95	107.30	114.70	122.10	129.60	137.15	144.80	152.50	160.25	....
41	95.25	102.70	110.15	117.65	125.15	132.70	140.35	148.10	155.90	163.70	....
42	98.85	106.45	114.20	121.95	129.75	137.60	145.50	153.50	161.55	169.65	$178.00
43	101.90	109.75	117.60	125.60	133.60	141.60	149.70	157.90	166.10	174.30	182.75
44	105.80	113.90	122.00	130.30	138.55	146.85	155.20	163.60	171.05	180.45	189.10
45	108.45	116.75	125.10	133.50	141.95	150.45	159.00	167.65	176.35	185.05	194.05
46	112.55	121.15	129.75	138.40	147.15	155.85	164.60	173.40	182.20	190.95	199.85
47	115.75	124.20	133.05	141.90	150.80	159.80	168.85	178.00	187.20	196.40	205.90
48	119.50	128.50	137.45	146.70	155.85	165.10	174.40	183.85	193.35	202.85	212.60
50	....	137.10	145.65	155.30	165.05	174.90	184.80	194.75	204.75	214.75	225.05
52	....	144.70	154.75	165.00	175.20	185.50	195.90	206.45	217.05	227.65	238.50
54	....	153.20	163.85	174.55	185.40	196.35	207.35	218.40	229.50	240.60	251.95
56	....	162.05	173.10	184.40	195.85	207.35	218.90	230.55	242.25	254.00	266.00
58	....	171.25	183.00	194.95	206.85	218.85	230.90	243.05	255.30	267.65	280.30
60	....	180.25	192.60	205.10	217.65	230.35	243.15	256.05	269.05	282.10	295.45
62	....	188.80	201.65	214.70	227.80	241.10	254.50	268.05	281.70	295.40	309.45
64	....	197.10	210.20	223.50	236.85	250.40	264.05	277.80	291.75	305.70	320.10
66	....	205.55	218.95	232.50	246.15	259.95	273.85	287.95	302.20	316.50	331.15
68	....	214.30	227.95	241.70	255.70	269.85	284.10	298.50	313.05	327.65	342.55
70	....	223.70	237.85	252.20	266.60	281.20	295.95	310.90	326.00	341.20	356.80
72	....	232.90	247.35	262.00	276.80	291.90	307.20	322.75	338.50	354.45	370.85
74	....	....	257.70	272.90	288.30	303.95	319.80	335.90	352.30	368.90	385.90
76	....	....	268.35	284.10	300.10	316.35	332.85	349.65	366.70	383.95	401.55
78	....	....	279.40	295.75	312.35	329.25	346.40	363.80	381.45	399.30	417.60
80	....	....	291.05	307.00	325.20	342.65	360.35	378.35	396.60	415.05	433.95
82	....	....	302.90	320.50	338.30	356.50	374.90	393.60	412.55	431.70	451.30
84	....	....	315.00	333.15	351.70	370.55	389.65	409.05	428.70	448.60	468.95
86	....	....	327.70	346.55	365.80	385.35	405.15	425.25	445.60	466.20	487.30
88	....	....	340.60	360.20	380.00	400.15	420.60	441.40	462.50	483.85	505.70
90	....	....	354.05	374.35	394.90	415.75	436.85	458.25	479.95	501.90	525.00
92	....	....	368.00	389.45	410.50	432.10	453.95	476.10	498.50	521.25	544.25
94	....	....	382.15	404.00	426.05	448.40	471.00	493.85	517.00	540.35	564.10
96	....	....	396.90	419.45	442.20	465.15	488.35	511.90	535.70	559.70	584.05
98	....	....	....	435.45	459.15	483.00	506.85	530.95	555.25	579.70	604.60
100	....	....	....	446.90	470.95	495.15	519.45	544.00	568.75	593.65	619.00
102	....	....	....	457.75	482.30	507.00	531.80	556.80	582.00	607.35	633.10
104	....	....	....	469.10	494.05	519.15	544.35	569.75	595.25	620.80	646.75
106	....	....	....	482.20	507.85	533.70	559.60	585.80	612.10	638.50	665.30
108	....	....	....	496.95	523.10	549.55	576.05	602.85	629.75	656.85	685.35
110	....	....	....	512.00	538.75	565.75	592.90	620.30	637.90	675.60	703.80
112	....	....	....	528.00	555.45	583.10	610.95	640.65	668.80	697.10	726.20
114	....	....	....	543.90	572.00	600.20	628.65	657.25	685.95	714.85	744.15
116	....	....	....	560.10	588.75	617.60	646.60	675.95	705.35	734.95	764.85
118	....	....	....	576.50	605.65	634.95	664.50	694.30	724.30	754.50	785.10
120	....	....	....	592.90	622.00	652.45	682.60	713.00	743.60	775.25	805.60

List prices of double belt pulleys include both Keyseat and set screw.

CAST IRON TIGHT AND LOOSE PULLEYS

TYPE "A" — NO. T-416

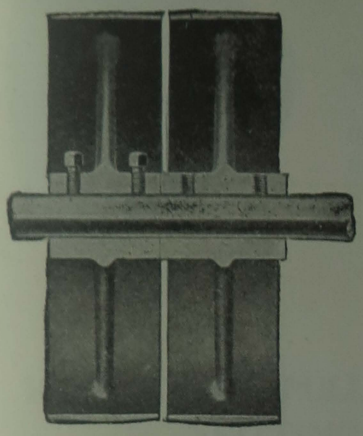


Fig. 1789

Standard and always furnished unless otherwise specified.

Tight and loose pulleys should always be made with crown faces.

The tight pulley hub is approximately equal in length to face width and faced one end, the loose hub slightly in excess of face width and faced both ends.

Extras to be added to List Prices of two standard pulleys to obtain list price per pair of Type "A" tight and loose pulleys.

Diameter, Inches	Face, Inches						
	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12	13 & 14	15 & 16
	Each	Each	Each	Each	Each	Each	Each
6 to 9	$1.30	$2.00	$3.00	$4.50	.....	.....	.....
10 to 15	1.50	2.30	3.40	5.00	$7.00	.....	.....
16 to 20	2.10	2.90	4.00	5.50	7.50	.....	.....
21 to 30	3.30	4.10	5.20	6.80	9.10	$12.50	.....
31 to 42	4.50	5.50	6.90	9.00	12.10	16.50	$23.00
43 to 60	6.00	7.40	9.30	12.00	15.80	21.00	29.00

TYPE "B" — NO. T-417

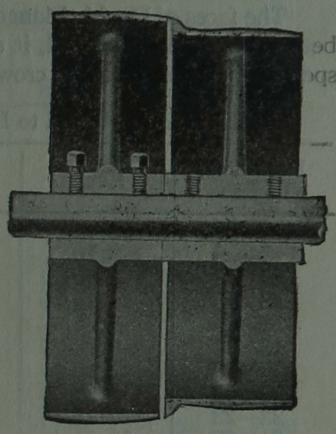


Fig. 1790

Loose pulley is smaller than the tight one so that the belt is relieved of all strain while running idle. Otherwise the same as Type "A."

Loose pulleys fitted with ball bearings or any of the many self-lubricating bushings can be furnished.

Extras to be added to List Prices of two standard pulleys to obtain list price per pair of Type "B" tight and loose pulleys.

Diameter, Inches	Face, Inches						
	3 & 4	5 & 6	7 & 8	9 & 10	11 & 12	13 & 14	15 & 16
	Each	Each	Each	Each	Each	Each	Each
6— 5½	$2.50	$3.20	$4.20	$5.70	.....	.....	.....
8— 7½	3.20	3.90	4.90	6.40	.....	.....	.....
10— 9½	3.45	4.25	5.35	6.95	$8.95	.....	.....
12—11½	3.85	4.65	5.75	7.35	9.35	.....	.....
14—13½	4.35	5.15	6.25	7.85	9.85	.....	.....
16—15½	5.40	6.20	7.30	8.80	10.80	.....	.....
18—17	5.90	6.70	7.80	9.30	11.30	.....	.....
20—19	6.50	7.30	8.40	9.90	12.90	.....	.....
22—21	8.40	9.20	10.30	11.90	14.20	$17.60	.....
24—23	9.05	9.85	10.95	12.55	14.85	18.25	.....
26—25	9.85	10.65	11.75	13.35	15.65	19.05	.....
28—27	10.65	11.45	12.55	14.15	16.45	19.85	.....
30—29	11.50	12.30	13.40	15.00	17.30	20.70	.....
32—31	13.60	14.60	16.00	18.10	21.20	25.60	$32.10
34—33	14.50	15.50	16.90	19.00	22.10	26.50	33.00
36—35	15.50	16.50	17.90	20.00	23.10	27.50	34.00
38—37	16.55	17.55	18.95	21.05	24.15	28.55	35.05
40—39	17.70	18.70	20.10	22.20	25.30	29.70	36.20
42—41	18.90	19.90	21.30	23.40	26.50	30.90	37.40
44—43	21.65	22.05	24.95	27.65	31.45	36.65	44.65
46—45	22.95	23.35	26.25	28.95	32.75	37.95	45.95
48—47	24.80	25.20	28.10	30.80	34.60	39.80	47.80
52—50	27.10	27.50	30.30	33.10	36.90	42.10	50.10
56—54	29.60	30.00	32.80	35.60	39.40	44.60	52.60
60—58	32.20	32.60	35.60	38.20	42.00	45.20	55.20

Loose pulleys fitted with ball bearings or any of the many self-lubricating bushings can be furnished. Prices of same with full description will be submitted upon application.

CAST IRON FLANGE PULLEYS

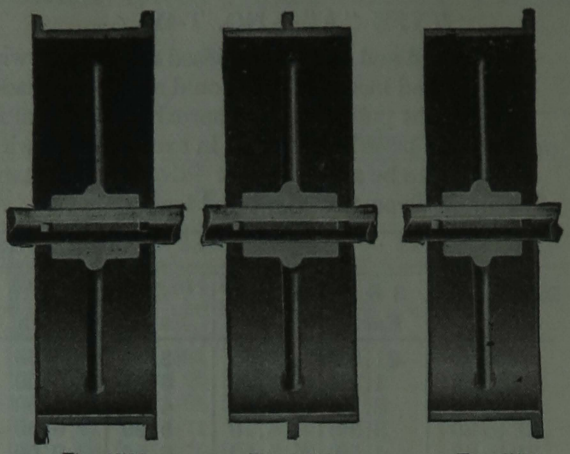


Fig. 1791 NO. T-418 | Fig. 1792 NO. T-419 | Fig. 1793 NO. T-420

The faces of Double Flange Pulleys are made slightly wider than the width of belt to be used. If an exact distance between flanges is required, it should be specified in ordering. When Single Flange Pulleys are ordered, be careful to specify if the faces shall be crown or straight. Flanges are finished all over.

Each to be Added to List Prices of Standard Pulleys to Obtain List Prices of Double Flange Pulleys.

Diameter, Inches	Each	Diameter, Inches	Each	Diameter, Inches	Each	Diameter, Inches	Each
6— 7	$2.40	26—27	$13.05	46—47	$33.85	84 —86	$84.75
8— 9	3.10	28—29	14.70	48—50	37.60	88— 90	90.10
10—11	3.90	30—31	16.40	52—54	42.25	92— 94	95.40
12—13	4.70	32—33	18.20	56—58	47.20	96— 98	100.85
14—15	5.65	34—35	20.05	60—62	52.25	100—102	106.00
16—17	6.60	36—37	21.95	64—66	57.50	104—106	111.80
18—19	7.60	38—39	24.10	68—70	62.85	108—110	117.15
20—21	8.80	40—41	26.35	72—74	68.30	112—114	122.35
22—23	10.15	42—43	28.75	76—78	73.75	116—118	127.35
24—25	11.50	44—45	31.30	80—82	79.30	120	132.05

For pulleys with but one flange add one-half above list.
For pulleys with three flanges add one and one-half above list.

INTERNAL FLANGE OR RETURN FLANGED RIMS

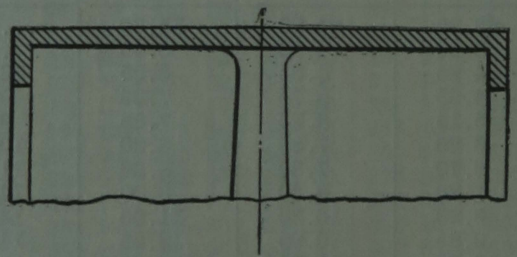


Fig. 1794
NO. T-421

Extras to be added to list price of pulley.

Diameter, Inches	Each	Diameter, Inches	Each	Diameter, Inches	Each	Diameter, Inches	Each
24	$11.50	33	$18.20	42	$24.00	52	$30.00
25	11.50	34	20.05	43	24.00	54	30.00
26	13.05	35	20.05	44	24.00	56	33.00
27	13.05	36	21.95	45	27.00	58	33.00
28	14.70	37	21.95	46	27.00	60	33.00
29	14.70	38	21.95	47	27.00	62	36.00
30	16.40	39	21.95	48	27.00	64	36.00
31	16.40	40	21.95	50	30.00	66	36.00
32	18.20	41	24.00				

Fig. 1795

CAST IRON STEP CONE PULLEYS

NO. T-422

These pulleys are made to order in the diameters, faces and number of steps required.

To obtain list prices for pulleys of this type of standard construction, it is necessary to consider each step as a separate pulley, using list of the double belt pulleys, and to the total list add as follows:

For pulleys 3 inches face or wider, add 50 per cent.

For pulleys 2¼ to 2¾ inches face, add 33⅓ per cent, using list for 3 inches face.

For pulleys 2 inches face and narrower, add 25 per cent, using list for 3 inches face.

KEYSEATING PULLEYS AND ROPE SHEAVES, MAKING KEYS AND FITTING PULLEYS AND SHEAVES TO SHAFTS

Shaft Size, Inches		Width of Face of Pulley, Inches							
		3 to 6	7 to 9	10 to 12	13 to 16	17 to 20	21 to 24	25 to 30	31 to 36
		Each	Each	Each	Each	Each	Each	Each	Each
1 3/16 to 2 1/8	Keyseating Pulley	$0.50	$0.60	$0.70	.....	.....	.....	.....	.....
	Price of Key	.20	.30	.35	.....	.....	.....	.....	.....
	Fitting	1.70	1.70	1.70	.....	.....	.....	.....	.....
2 3/16 to 2 5/8	Keyseating Pulley	.60	.70	.80	$1.00	$1.20	.....	.....	.....
	Price of Key	.30	.35	.40	.50	.60	.....	.....	.....
	Fitting	1.70	1.85	2.00	2.20	2.40	.....	.....	.....
2 11/16 to 3 1/8	Keyseating Pulley	.75	.85	1.20	1.70	2.35	$3.00	$3.70	$4.15
	Price of Key	.35	.40	.50	.60	.70	1.00	1.20	1.40
	Fitting	1.85	2.00	2.20	2.40	2.70	3.00	3.50	4.00
3 3/16 to 3 5/8	Keyseating Pulley	.85	.95	1.30	1.80	2.45	3.10	3.80	4.25
	Price of Key	.50	.60	.70	.85	1.00	1.20	1.40	1.70
	Fitting	1.95	2.10	2.30	2.50	2.90	3.20	3.70	4.25
3 11/16 to 4 1/8	Keyseating Pulley	1.00	1.20	1.50	2.00	2.70	3.35	4.00	4.75
	Price of Key	.70	.80	.90	1.00	1.10	1.30	1.50	1.90
	Fitting	2.00	2.20	2.40	2.70	3.15	3.85	4.50	5.00
4 3/16 to 4 5/8	Keyseating Pulley	1.30	1.65	2.00	2.50	3.00	3.50	4.20	5.00
	Price of Key	.75	.85	.95	1.05	1.20	1.35	1.65	2.00
	Fitting	2.35	2.70	3.00	3.35	4.20	5.00	5.85	6.70
4 11/16 to 5 3/8	Keyseating Pulley	1.50	1.95	2.35	3.00	3.70	4.35	5.00	5.85
	Price of Key	.85	.95	1.05	1.20	1.35	1.50	1.70	2.00
	Fitting	3.00	3.35	3.85	4.35	5.00	5.85	6.70	7.50
5 7/16 to 6 1/4	Keyseating Pulley	2.00	2.55	3.05	3.80	4.60	5.35	6.25	7.35
	Price of Key	1.00	1.15	1.30	1.45	1.60	1.75	2.10	2.50
	Fitting	3.75	4.10	4.55	5.35	6.00	7.10	8.00	9.00
6 5/16 to 7 1/4	Keyseating Pulley	2.50	3.15	3.75	4.60	5.50	6.35	7.50	8.85
	Price of Key	1.25	1.50	1.75	2.00	2.35	2.70	3.15	3.65
	Fitting	4.75	5.10	5.55	6.60	7.25	8.60	9.50	10.50
7 5/16 to 8	Keyseating Pulley	3.00	3.75	4.45	5.40	6.40	7.35	8.75	10.35
	Price of Key	1.75	2.10	2.45	2.80	3.25	3.60	4.15	4.75
	Fitting	6.00	6.35	6.80	7.30	8.75	10.60	11.50	12.50

STANDARD KEYSEAT DIMENSIONS

For Pulleys and Rope Sheaves

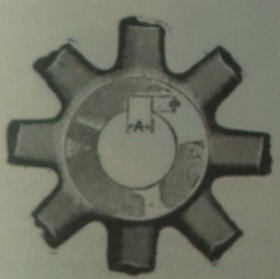


Fig. 1796

Diameter Shaft, Inches	A	B	Diameter Shaft, Inches	A	B
15/16 — 1 1/8	1/4	1/8	3 7/16 — 3 5/8	7/8	7/16
1 3/16 — 1 3/8	5/16	5/32	3 11/16 — 3 7/8	15/16	15/32
1 7/16 — 1 5/8	3/8	3/16	3 15/16 — 4 1/8	1	1/2
1 11/16 — 1 7/8	7/16	7/32	4 3/16 — 4 5/8	1 1/8	1/2
1 15/16 — 2 1/8	1/2	1/4	4 11/16 — 5 3/8	1 1/4	1/2
2 3/16 — 2 3/8	9/16	9/32	5 7/16 — 5 5/8	1 3/8	1/2
2 7/16 — 2 5/8	5/8	5/16	5 11/16 — 6 7/8	1 1/2	5/8
2 11/16 — 2 7/8	11/16	11/32	6 15/16 — 7 7/8	1 3/4	3/4
2 15/16 — 3 1/8	3/4	3/8	7 15/16 — 8 7/8	2	3/4
3 3/16 — 3 3/8	13/16	13/32			

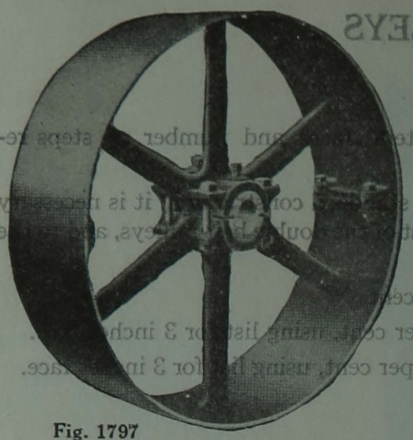


Fig. 1797

CAST IRON SPLIT PULLEYS

UNIVERSAL GIANT

This cast iron split pulley with bored and turned interchangeable cast iron bushings is the highest development in the cast iron pulley line. Can be used on any size shafting within limits of standard bores.

The rim, arms and hub are integral and being of cast iron, a non-flexible material, a rigid structure is obtained with practically no possibility of distortion or wearing out.

All pulleys of this type are made solid in the casting and split apart before finishing.

When bolted together the two halves intermember at rim fractures, presenting the appearance of a solid rim and insuring a permanent and perfectly round structure.

The bushings are cast whole and are bored, turned and shipped solid. They are easily split apart with an ordinary cold chisel.

The fractures at hub and bushings are cut back to provide for free clamping action and in addition to this perfect grip two setscrews are provided. These setscrews run through bushings to shaft.

Diameter, Inches	Standard Bores, Inches	Face, Inches								
		3	4	5	6	7	8	9	10	12
		Each	Each	Each	Each	Each	Each	Each	Each	Each
6	2 7/16	$3.25	$3.85	$4.05	$4.30	$4.95	$5.20	....	....	....
7		3.40	4.00	4.25	4.50	5.15	5.40	....	....	....
8		3.55	4.20	4.45	4.70	5.35	5.60	$6.00	$6.40	....
9		3.70	4.35	4.60	4.90	5.60	5.90	6.25	6.65	....
10	2 15/16	3.85	4.50	4.80	5.15	5.85	6.20	6.55	6.90	$8.00
11		4.20	5.15	5.45	5.80	6.80	7.20	7.50	7.90	9.00
12		4.35	5.35	5.70	6.05	7.05	7.40	7.80	8.20	10.20
13			5.55	5.90	6.30	7.30	7.75	8.10	8.55	10.80
14			5.75	6.10	6.55	7.55	8.05	8.45	8.95	11.25
15			5.95	6.35	6.80	7.90	8.35	8.80	9.30	11.50
16			6.15	6.60	7.10	8.20	8.70	9.15	9.70	12.00
17			6.40	6.90	7.40	8.55	9.05	9.60	10.15	12.50
18			6.65	7.15	7.70	8.90	9.45	10.00	10.60	13.10
19			7.35	8.65	9.25	10.50	11.10	11.70	12.35	15.35
20			7.60	8.95	9.60	10.90	11.55	12.20	12.90	16.00
21			7.90	9.25	9.95	11.30	12.00	12.70	13.45	16.65
22			8.20	9.55	10.30	11.70	12.45	13.20	14.00	17.30
23			8.45	9.90	10.65	12.10	12.90	13.70	14.55	18.00
24			9.70	11.25	12.05	13.85	14.70	15.60	16.50	20.40
26	3 7/16		10.50	12.05	13.00	14.85	15.95	16.90	18.00	22.25
28			11.30	12.90	13.90	16.00	17.10	18.30	19.50	24.10
30			12.15	13.85	14.95	17.15	18.40	19.70	21.15	25.85
32			13.90	16.05	17.25	19.70	21.15	22.65	24.15	30.35
34			14.90	17.10	18.50	21.10	22.60	24.30	25.85	32.30
36			15.90	18.25	19.70	22.45	24.10	25.85	27.60	34.30
38	3 15/16		19.05	21.45	23.10	27.85	28.95	30.80	32.70	40.15
40			20.20	22.80	24.60	28.80	30.70	32.65	34.65	42.30
42			21.40	24.20	26.10	30.45	32.45	34.50	36.60	44.50
44			22.75	25.70	27.75	32.20	34.35	36.50	38.70	46.90
46			24.15	27.20	29.35	33.95	36.25	38.50	40.85	49.30
48			29.00	31.20	33.50	38.85	41.25	43.65	46.15	56.20
50				32.80	35.30	40.75	43.25	45.80	48.45	58.80

Each pulley requires two bushings, one at each end of hub, for reducing bore and same are included in above list prices. Additional bushings will be supplied at list prices given below.

SPLIT PULLEY BUSHINGS

Price for Two Bushings

Bore of Bushing, Inches	Outside Diameter of Bushing, Inches			
	2 7/16	2 15/16	3 7/16	3 15/16
1 7/16	$0.50	$0.80	$1.20	$1.60
1 11/16	.60	.90	1.30	1.70
1 15/16	.70	1.00	1.40	1.80
2 3/16	.80	1.10	1.50	1.90
2 7/16	....	1.20	1.60	2.00
2 11/16	....	1.30	1.70	2.10
2 15/16	....	....	1.80	2.20
3 3/16	....	....	1.90	2.30
3 7/16	....	....	....	2.40
3 11/16	....	....	....	2.50

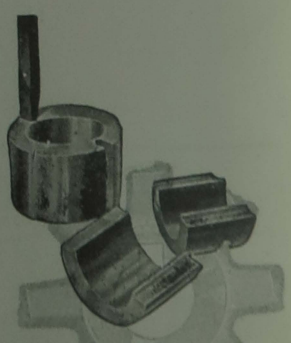


Fig. 1798

Slots in each bushing may be made same width as standard size keyseat for shaft the bushing is bored to fit.

When it is desired to use a key, all that is necessary is to grind the connecting metal back even with body of bushing, as shown in illustration. It is impossible for bushings to turn, as they are keyed to shaft and the setscrews act as keys between bushings and hub of pulley.

LOOSE PULLEY BUSHINGS

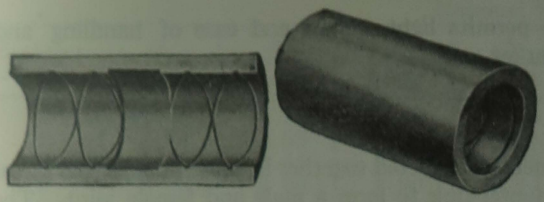


Fig. 1799

Made for use with any type of split pulley so that they may be utilized to run loose on shaft either as part of a pair of tight and loose pulleys or as an idler pulley. Bushings are made of cast iron, either solid or split, and are accurately finished all over.

The bore is reamed to size and counterbored at center to hold an ample supply of oil or grease.

The patent continuous spiral oil groove is cut at each end and the machine is so set as to cut into oil reservoir at each side.

Bushings are tapped for oil or grease cups.

Bushings must be long enough to have room for hub of pulley between tapped hole and other end.

SOLID BUSHINGS

NO. T429

Outside Dia., Ins.	Bore, Ins.	Lgth., Ins.	Each
2 7/16	1 3/16-1 1/4	4 1/4	$2.80
		5 1/4	3.00
		6 1/4	3.20
		7 1/4	3.60
		8 1/4	4.00
2 7/16	1 7/16-1 1/2	4 1/4	2.70
		5 1/4	2.90
		6 1/4	3.05
		7 1/4	3.45
		8 1/4	3.80
2 7/16	1 11/16-1 3/4	4 1/4	2.70
		5 1/4	2.90
		6 1/4	3.05
		7 1/4	3.45
		8 1/4	3.80
		10 1/4	4.60
2 15/16	1 15/16-2	4 1/4	3.25
		5 1/4	3.50
		6 1/4	3.75
		7 1/4	4.00
2 15/16	1 15/16-2	8 1/4	$4.50
		10 1/4	5.50
		12 1/4	6.50
2 15/16	2 3/16-2 1/4	4 1/4	3.25
		5 1/4	3.50
		6 1/4	3.75
		7 1/4	4.00
		8 1/4	4.50
		10 1/4	5.50
		12 1/4	6.50
3 1/2	1 15/16-2	5 1/4	4.20
		6 1/4	4.50
		7 1/4	5.00
		8 1/4	5.60
		10 1/4	6.80
		12 1/4	8.00
3 1/2	2 3/16-2 1/4	5 1/4	4.20
		6 1/4	4.50
		7 1/4	5.00
		8 1/4	5.60
		10 1/4	6.80
		12 1/4	8.00
3 1/2	2 7/16-2 1/2	5 1/4	4.20
		6 1/4	4.50
		7 1/4	5.00
		8 1/4	5.60
		10 1/4	6.80
		12 1/4	8.00
3 1/2	2 11/16-2 3/4	5 1/4	4.60
		6 1/4	4.95
		7 1/4	5.50
		8 1/4	6.15
		10 1/4	7.50
		12 1/4	8.80
3 15/16	2 15/16-3	5 1/4	6.25
		6 1/4	7.00
		7 1/4	7.75
		8 1/4	8.75
		10 1/4	10.25
		12 1/4	12.50

To obtain list prices of split bushings, add 25 per cent to list prices of solid.

Fig. 1800

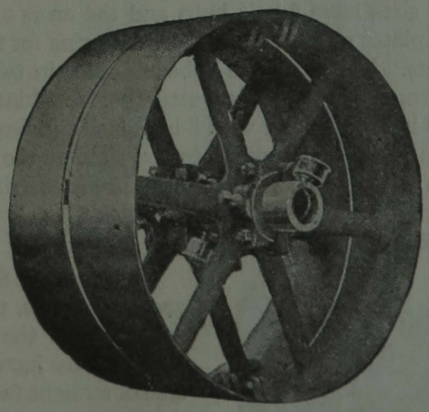


Fig. 1801

The illustrations show a pair of tight and loose pulleys made up by using two Universal Giant Split Cast Iron Pulleys and one of the loose pulley bushings.

Bushings are also applicable to steel, wood or any other type of split pulley.

STEEL SPLIT PULLEYS

ONEIDA

Built to safely withstand maximum belt stresses. The design permits light weight and ease of handling and makes them the most desirable of the various steel pulleys on the market.

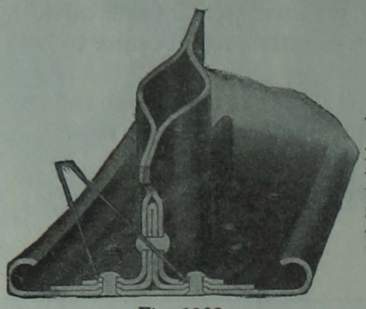


Fig. 1802

Wherever two or more pieces of metal are riveted together in these pulleys, the metal through which the rivet passes is countersunk to form a male and female joint. The rivets are thus relieved of all lateral and shearing strain since they are only needed to hold the metals together. By reason of this method also, the rivets that connect the arm and rim are slightly below the face of the rim and do not come in contact with the belt nor injure it.

Pulleys of sizes larger than 17-inch diameter, except 18, 19 and 20-inch diameter, with faces 5 inches wide and less, have the hubs reinforced with a malleable iron yoke as shown in the illustration. These hubs, when fitted with bushings and compressed to the shaft, form a permanent fastening which grips uniformly over the entire area of contact and insures the firmness of the pulley on the shaft and perfect running balance.

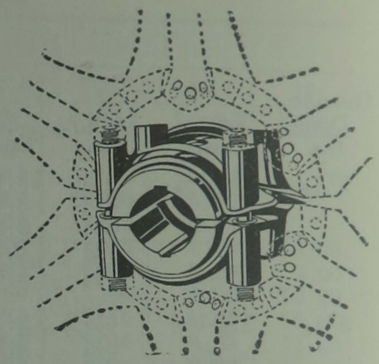


Fig. 1803

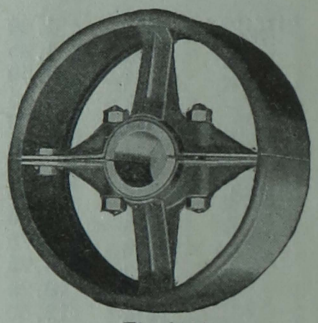


Fig. 1804

NO. T-432

Made in all sizes from 6-inch diameter with 2-inch face to 168-inch diameter with 40-inch face. The design changes as the size increases to provide a generous margin of strength for the work they are intended to do.

Rims are rolled in one piece from heavy gauge metal and a smooth oval crown face is obtained which is without a seam or groove and provides full contact for the belt.

The accompanying illustration shows the construction of sizes 9 to 11-inch diameter; 6, 7, and 8-inch diameter pulleys are similar, but are built without braces.

Sizes 12 to 17-inch diameter inclusive and sizes 18, 19 and 20-inch diameter, having faces 5 inches wide and less, have double rim braces and construction as shown in the accompanying illustration.

Larger sizes have 4-bolt hubs and the arms are attached to fish plates at the rim. These fish plates provide a broad solid bearing for the arms and allow the use of more and larger rivets. The arms and hubs are made in two pieces and the arms are interwoven into the flanges of the hub and securely riveted into place.

Size 40-inch diameter with 8-inch face and larger are provided with auxiliary arms which give additional support to the rims at the split joints. This construction does away with the possibility of vibration from centrifugal or centipedal stresses.

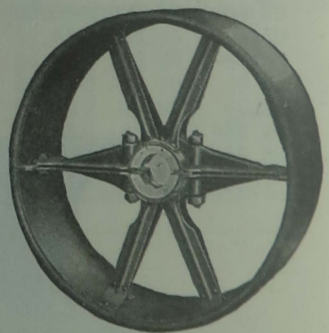


Fig. 1805

NO. T-433

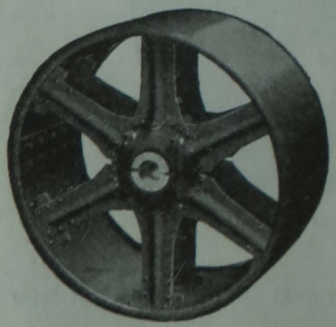


Fig. 1806

NO. T-436

Beginning at 8-inch face in the smaller sizes and at 10 and 12-inch face in the medium and larger sizes, these pulleys are constructed with two or more sets of arms as may be necessary for the proper support of the rims. This construction with multiple sets of arms greatly increases the load-carrying capacity and is of particular advantage in the case of straight face pulleys on which shifting belts are operated since the rim always has a direct support under the center of the belt.

These principles of construction permit the use of pulleys as large as 14 feet in diameter with a 40-inch face for main drive purposes. For extremely heavy or intermittent loads such as air compressor drives and rolling mill service, a special 8-arm extra heavy pulley can be supplied.

STEEL SPLIT PULLEYS

ONEIDA

Nominal Width of Face in Inches

Diameter, Inches	2	3	4	5	6	8	10	12	14	16
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
6	$3.15	$3.30	$3.45	$3.75	$4.05	$4.60	$5.20	$5.90	.....	.....
7	3.22	3.38	3.60	3.90	4.20	4.80	5.40	6.10	.....	.....
8	3.30	3.45	3.75	4.05	4.35	4.95	5.60	6.25	.....	.....
9	3.38	3.60	3.90	4.20	4.50	5.10	5.75	6.35	.....	.....
10	3.45	3.75	4.05	4.35	4.65	5.25	5.90	6.45	.....	.....
11	3.65	3.90	4.20	4.50	4.80	5.40	6.00	6.90	.....	.....
12	3.90	4.20	4.63	4.80	5.33	5.78	6.45	7.65	$9.00	$10.25
13	4.05	4.35	4.80	5.20	5.62	6.43	7.20	8.40	9.50	10.75
14	4.20	4.50	5.20	5.65	6.15	7.05	8.03	9.00	10.00	11.25
15	.....	4.65	5.45	5.80	6.55	7.65	8.80	9.75	10.75	12.00
16	.....	4.95	5.75	6.10	6.90	8.25	9.45	10.50	11.50	12.65
17	.....	5.25	6.00	6.50	7.28	8.78	10.05	11.25	12.40	13.65
18	.....	5.55	6.38	7.00	7.65	9.30	10.65	12.00	13.25	14.50
19	.....	5.80	6.75	7.50	8.25	10.13	11.25	12.90	14.20	15.60
20	.....	6.00	7.50	8.10	9.00	10.73	12.00	14.25	15.30	16.90
21	.....	6.25	8.00	8.90	9.60	11.25	12.98	15.60	18.00	20.55
22	.....	6.50	8.55	9.50	10.28	12.00	14.10	16.80	19.50	21.30
23	.....	7.00	8.70	9.90	10.58	12.60	14.75	18.00	21.00	24.30
24	.....	7.50	8.90	10.00	10.95	13.20	15.68	19.05	22.65	26.25
25	.....	.....	9.20	10.25	11.45	13.80	16.40	20.20	24.50	29.25
26	.....	.....	9.55	10.50	11.95	14.40	17.10	21.30	26.25	31.20
28	.....	.....	10.80	11.70	12.90	15.45	18.15	22.90	28.50	34.50
30	.....	.....	12.00	12.90	14.10	17.25	19.90	24.75	31.50	38.10
32	.....	.....	13.20	14.10	15.45	19.35	22.50	26.85	34.15	41.65
34	.....	.....	14.40	15.75	17.25	21.75	25.50	30.00	36.75	45.00
36	.....	.....	15.90	17.85	19.50	24.00	28.65	33.75	39.75	48.60
38	.....	.....	19.50	20.65	21.75	26.40	31.05	37.15	42.75	51.75
40	.....	.....	21.00	22.75	24.00	28.50	33.75	40.15	46.50	55.15
42	.....	.....	23.25	24.85	26.25	32.25	37.50	43.50	50.25	57.75
44	.....	.....	.....	.....	29.25	35.62	41.25	47.25	54.00	61.12
46	.....	.....	.....	.....	33.00	39.00	45.00	50.25	57.75	64.50
48	.....	.....	.....	.....	36.75	42.00	48.75	54.00	61.50	67.50
50	.....	.....	.....	.....	40.87	47.25	53.25	58.50	66.00	75.00
52	.....	.....	.....	.....	46.50	51.00	57.00	63.00	69.00	78.75
54	.....	.....	.....	.....	50.25	56.25	61.50	67.50	74.25	83.25
56	.....	.....	.....	.....	54.00	60.75	66.75	72.75	80.25	90.00
58	.....	.....	.....	.....	60.00	65.25	71.25	78.37	86.62	96.37
60	.....	.....	.....	.....	63.75	70.50	77.25	84.00	93.00	102.75
62	.....	.....	.....	.....	.....	72.85	84.30	95.95	107.55	119.95
64	.....	.....	.....	.....	.....	76.50	88.20	100.10	111.95	124.60
66	.....	.....	.....	.....	.....	80.25	92.20	104.35	116.45	129.35
68	.....	.....	.....	.....	.....	84.15	96.35	108.75	121.10	134.25
70	.....	.....	.....	.....	.....	88.10	100.70	113.55	126.35	139.95
72	.....	.....	.....	.....	.....	92.15	105.05	118.15	131.30	145.40
74	.....	.....	.....	.....	.....	96.35	109.65	123.20	136.85	151.50
76	.....	.....	.....	.....	.....	100.65	114.30	128.35	142.55	157.75
78	.....	.....	.....	.....	.....	105.05	119.15	133.70	148.45	164.20
80	.....	.....	.....	.....	.....	109.60	124.25	139.35	154.65	170.95
82	.....	.....	.....	.....	.....	114.25	129.45	145.10	160.95	177.90
84	.....	.....	.....	.....	.....	119.00	134.75	150.95	167.50	184.95
86	.....	.....	.....	.....	.....	123.90	140.25	157.10	174.20	192.40
88	.....	.....	.....	.....	.....	128.90	145.85	163.35	181.05	199.90
90	.....	.....	.....	.....	.....	.....	151.70	169.85	188.20	207.65
92	.....	.....	.....	.....	.....	.....	157.75	176.55	195.70	215.85
94	.....	.....	.....	.....	.....	.....	163.85	183.45	203.20	223.95
96	.....	.....	.....	.....	.....	.....	170.15	190.55	210.95	232.35
98	.....	.....	.....	.....	.....	.....	176.60	197.85	219.10	241.20
100	.....	.....	.....	.....	.....	.....	181.50	203.20	224.90	247.45
102	.....	.....	.....	.....	.....	.....	186.40	208.45	230.50	253.40
104	.....	.....	.....	.....	.....	.....	191.35	213.85	236.30	259.55
106	.....	.....	.....	.....	.....	.....	196.95	220.00	243.05	266.95
108	.....	.....	.....	.....	.....	.....	203.40	226.90	250.45	274.90
110	.....	.....	.....	.....	.....	.....	210.00	234.00	258.05	283.05
112	.....	.....	.....	.....	.....	.....	216.85	241.45	266.15	291.75
114	.....	.....	.....	.....	.....	.....	.....	248.90	274.15	300.30
116	.....	.....	.....	.....	.....	.....	.....	256.50	282.30	309.00
118	.....	.....	.....	.....	.....	.....	.....	264.20	290.50	317.65
120	.....	.....	.....	.....	.....	.....	.....	271.95	298.70	326.40
126	.....	.....	.....	.....	.....	.....	.....	290.00	316.00	363.00
132	.....	.....	.....	.....	.....	.....	.....	307.00	335.00	383.00
138	.....	.....	.....	.....	.....	.....	.....	324.00	352.00	402.00
144	.....	.....	.....	.....	.....	.....	.....	341.00	370.00	421.00

STEEL SPLIT PULLEYS

ONEIDA

Nominal Width of Face in Inches

Diameter, Inches	18	20	22	24	26	28	30	32	34	36
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
24	$ 29.92	$ 34.50	.....	.....	.....	.....	.....	.....	.....	.....
25	35.05	39.50	.....	.....	.....	.....	.....	.....	.....	.....
26	36.15	41.40	.....	.....	.....	.....	.....	.....	.....	.....
28	40.35	46.35	.....	.....	.....	.....	.....	.....	.....	.....
30	45.00	49.50	$ 55.50	$ 61.50	$ 67.50	$ 74.25	$ 81.67	.....	.....	.....
32	48.37	54.37	60.37	66.37	72.37	79.90	87.56	$ 96.31	.....	.....
34	51.75	57.45	63.75	69.75	75.00	82.50	90.75	99.82	.....	.....
36	55.50	61.50	67.50	73.50	79.50	87.45	96.19	105.80	$116.38	$128.01
38	58.87	64.87	70.87	76.87	82.87	91.15	100.26	110.28	121.30	133.43
40	62.25	69.75	77.25	84.75	92.55	101.80	111.98	123.17	135.48	149.02
42	65.62	73.12	80.62	88.12	95.62	105.18	115.69	127.25	139.97	153.96
44	69.00	78.00	87.00	96.00	105.00	115.50	127.05	139.75	153.72	169.09
46	72.00	81.00	90.00	99.00	108.00	118.80	130.68	143.74	158.11	173.92
48	75.00	87.00	99.00	111.00	123.00	135.30	148.83	163.71	180.08	198.08
50	84.00	96.00	108.00	120.00	132.00	145.20	159.72	175.69	193.25	212.57
52	90.00	102.00	114.00	126.00	138.00	151.80	166.98	183.67	202.03	222.23
54	96.75	108.75	120.75	132.75	144.75	159.22	175.14	192.65	211.91	233.10
56	104.25	119.25	134.25	149.25	164.25	180.67	198.73	218.60	240.46	264.50
58	110.62	125.62	140.62	155.62	170.62	187.68	206.44	227.08	249.78	274.75
60	117.00	132.00	147.00	162.00	177.00	194.70	214.17	235.58	259.13	285.04
62	132.30	144.85	185.80	201.65	214.70	227.80	241.10	254.50	268.05	281.70
64	137.20	150.00	197.10	210.20	223.50	236.85	250.40	264.05	273.85	291.75
66	142.20	155.30	205.55	218.95	232.50	246.15	259.95	273.85	287.95	302.20
68	147.40	160.80	214.30	227.95	241.70	255.70	269.85	284.10	298.50	313.05
70	153.60	167.60	223.70	237.85	252.20	266.60	281.20	295.95	310.90	326.00
72	159.65	174.30	232.90	247.35	262.00	276.80	291.90	307.20	322.75	338.50
74	166.30	181.50	240.40	257.70	272.90	288.30	303.95	319.80	335.90	352.30
76	173.10	188.95	245.30	268.35	284.10	300.10	316.35	332.85	349.65	366.70
78	180.20	196.60	251.60	279.40	295.75	312.35	329.25	346.40	363.80	381.45
80	187.45	204.40	256.70	291.05	307.00	325.20	342.65	360.35	378.35	396.60
82	195.05	212.65	262.30	302.90	320.50	338.30	356.50	374.90	393.60	412.55
84	202.75	221.05	265.40	315.00	333.15	351.70	370.55	389.65	409.05	428.70
86	210.85	229.80	269.70	327.70	346.55	365.80	385.35	405.15	425.25	445.60
88	218.95	238.55	274.60	340.60	360.20	380.00	400.15	420.60	441.40	462.50
90	227.30	247.45	279.80	354.05	374.35	394.90	415.75	436.85	458.25	479.95
92	236.10	256.85	283.90	368.00	389.45	410.50	432.10	453.95	476.10	498.50
94	244.95	266.35	288.20	382.15	404.00	426.05	448.40	471.00	493.85	517.00
96	253.90	275.85	298.25	396.90	419.45	442.20	465.15	488.35	511.90	535.70
98	263.25	285.65	308.50	410.75	435.45	459.15	483.00	506.85	530.95	555.25
100	269.90	292.65	315.80	424.60	446.90	470.95	495.15	519.45	544.00	568.75
102	276.35	299.50	322.90	438.40	457.75	482.30	507.00	531.80	556.80	582.00
104	282.75	306.20	329.95	452.25	469.10	494.05	519.15	544.35	569.75	595.25
106	290.90	315.10	339.50	466.10	482.20	507.85	533.70	559.60	585.80	612.10
108	299.40	324.70	349.40	479.95	496.95	523.10	549.55	576.05	602.85	629.75
110	308.15	333.53	359.35	493.80	512.00	538.75	565.75	592.90	620.30	637.90
112	317.35	343.30	369.60	507.60	528.00	555.45	583.10	610.95	640.65	668.80
114	326.45	352.95	379.80	521.45	543.90	572.00	600.20	628.65	657.25	685.95
116	335.80	362.90	390.30	535.30	560.10	588.75	617.60	646.60	675.95	705.35
118	344.95	372.65	400.70	549.15	576.50	605.65	634.95	664.50	694.30	724.30
120	354.25	382.50	411.20	563.00	592.90	622.00	652.45	682.60	713.00	743.60
126	391.00	473.00	534.00	567.00	613.00	637.00	665.00	734.00	769.00	804.00
132	412.00	500.00	560.00	598.00	634.00	671.00	709.00	774.00	811.00	848.00
138	433.00	536.00	589.00	629.00	667.00	707.00	746.00	813.00	853.00	892.00
144	454.00	553.00	618.00	660.00	721.00	742.00	784.00	853.00	895.00	936.00

EXTRAS FOR PULLEYS HAVING BORES LARGER THAN STANDARD

	Per Hub
14 to 25-Inch Diameters, Inclusive, Fitted with "I" Hubs	$ 2.50
26 to 30-Inch Diameters, Inclusive, in 3, 4, 5, 6 and 8-Inch Width Faces, Fitted with "I" Hubs	3.00
26 to 30-Inch Diameters, Inclusive, in Widths Greater than 8 Inches, and all Diameters over 30 Inches. No Extra Charge for "I" Hubs.	5.00
17 to 60-Inch Diameters, Inclusive, Fitted with "J" Hubs	7.50
17 to 60-Inch Diameters, Inclusive, Fitted with "K" Hubs	
62-Inch Diameters and Larger, all Face Widths. No Extra Charge for "J" and "K" Hubs.	
28-Inch Diameters and Larger, Fitted with "O," 8-Arm, High Flange, Malleable Hubs, 4 7/16-Inch Bore	12.00
28 to 96-Inch Diameters, Fitted with "P," 8-Arm, High Flange Malleable Hubs, 8½-Inch Bore	15.00

EXTRA BUSHINGS

"F", "G" and "H" Bushings, Each	$0.60	"J" Bushings, Each	$4.00
"I" Bushings, Each	1.20	"K" Bushings, Each	6.00

EXTRA KEYSEATING BUSHINGS

1 to 3-Inch Bore, Net Each	$0.50	Over 4 7/16-Inch Bore, Net Each	$1.50
3⅛ to 4 7/16-Inch Bore, Net Each	.75		

STEEL SPLIT PULLEYS

NATIONAL

Fig. 1807

Suitable for use on small motors, wood or metal working machinery, and for any service that requires the use of a small pulley. Made in 3, 4 and 5-inch diameters.

The compression bolts are easily reached through holes in the face of the pulley. With each pulley a socket wrench is furnished.

Interchangeable metal bushings are furnished with these pulleys for all standard shaft sizes less than standard bores.

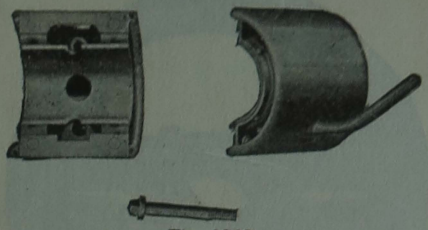
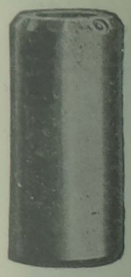


Fig. 1808

Width Face, Inches

Dia., Inches	3 Standard Bore, Inches	3 Each	4 Dia., Inches	4 Standard Bore, Inches	4 Each	5 Dia., Inches	5 Standard Bore, Inches	5 Each	6 Dia., Inches	6 Standard Bore, Inches	6 Each
3	1 7/16	$2.40	3	1 7/16	$2.52	3	1 7/16	$2.68	3	1 7/16	$3.00
4	1 15/16	2.52	4	1 15/16	2.64	4	1 15/16	2.75	4	1 15/16	3.10
5	1 15/16	2.64	5	1 15/16	2.75	5	1 15/16	2.87	5	1 15/16	3.25

List price of extra bushings, each, $0.30.



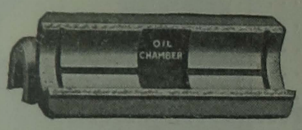


Fig. 1809

LOOSE SLEEVES

For Use With Oneida Steel Split Pulleys

Cast in one piece, bored, turned accurately to size and split. When clamped together in a pulley, the two halves intermember at fractures and maintain true inner and outer diameters.

A large reservoir is provided in the center for lubricating oil. Circular and lengthwise gains distribute the oil evenly to the bearing, returning it to the oil chamber when the pulley is not in motion. The oil chamber is filled through a convenient spring oiler.

Outside Diameter, Inches	Bore, Inches	Length, Inches	Each	Outside Diameter, Inches	Bore, Inches	Length, Inches	Each
2 7/16	1 to 1 3/4	4 1/2	$3.45			4 1/2	$4.30
		5 1/2	3.85			5 1/2	4.95
		4 1/2	3.85			6 1/2	5.50
		5 1/2	4.50	3 1/2	1 3/16 to 2 3/4	7 1/2	6.50
		6 1/2	5.00			9 1/2	8.30
2 15/16	1 to 2 3/16	7 1/2	5.50			10 1/2	9.50
		9 1/2	6.50			12 1/2	10.70
		10 1/2	7.00			6 1/2	8.00
		12 1/2	8.00			7 1/2	9.00
				4 7/16	1 15/16 to 3 7/16	9 1/2	10.90
						10 1/2	12.20
						12 1/2	14.50

Bushings should be 1 1/2 inch longer than nominal face width of pulley.

APPROXIMATE WEIGHT OF ONEIDA STEEL PULLEYS WITHOUT BUSHINGS

Dia., Inches	Width of Face in Inches 2	3	4	5	6	8	10	12	14	16
6	4	4	5	5	6	8	10	..	..	..
7	5	5	5	6	7	10	11	11	..	..
8	5	6	7	8	9	14	16	18	..	..
9	6	8	9	11	12	18	20	22	..	..
10	7	8	9	12	13	20	22	24	..	..
11	7	9	10	13	14	21	23	26	..	..
12	7	11	12	16	17	26	28	31	35	36
13	8	12	13	17	18	27	30	33	36	39
14	8	12	14	17	19	29	33	35	38	41
15	..	14	15	19	20	32	36	47	51	52
16	..	15	16	20	22	34	38	50	52	55
17	..	15	17	22	23	36	40	51	54	59
18	..	26	28	29	35	46	49	54	81	85
19	..	27	29	31	36	49	51	55	82	87
20	..	28	29	32	37	49	53	57	85	88
21	..	29	31	32	42	51	56	60	89	94
22	..	30	32	34	43	52	57	61	93	100
23	..	31	33	35	44	53	58	63	94	102
24	..	32	34	35	44	55	60	91	95	103

Dia., Inches	Width of Face in Inches 3	4	5	6	8	10	12	14	16
26	34	36	39	49	60	66	98	108	112
28	36	38	41	52	64	70	105	112	118
30	37	43	47	61	67	72	107	116	125
32	39	45	50	65	70	80	111	124	130
34	42	49	53	66	73	82	115	129	134
36	46	51	56	68	103	110	116	188	195
38	..	55	59	71	105	115	119	193	203
40	..	57	62	73	113	122	128	211	218
42	..	59	64	77	119	129	133	213	227
44	..	61	66	79	121	130	139	222	232
46	..	64	69	81	127	136	142	229	238
48	..	66	70	85	130	139	147	234	246
50	..	..	..	125	135	150	153	246	254
52	..	..	..	130	140	152	161	252	268
54	..	..	..	132	147	159	164	258	274
56	..	..	..	135	151	162	168	265	281
58	..	..	..	139	153	166	175	274	289
60	..	..	..	147	163	174	283	292	303
72	..	..	..	..	234	245	400	440	455

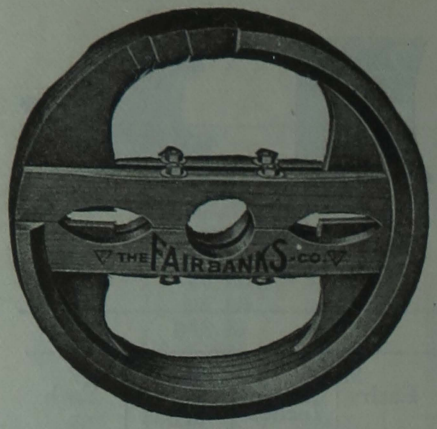


Fig. T-453

WOOD SPLIT PULLEYS

FAIRBANKS

Each made up as a unit, nailed and glued together, best selected air and kiln-dried lumber being used.

3, 4, 5 and 6-inch diameters are of the two piece block type. When placed on shaft the halves are drawn together with heavy slot head bolts, the nuts of which are securely anchored in one half of pulley.

7, 8, 9 and 10-inch diameters are in three pieces. The two parts that fit shaft are drawn together by clamping bolts, the heads of which are securely anchored in one half of pulley. The third part or cap covers the nuts of clamping bolts and is secured to place by slot head bolts, the nuts of which are anchored in part to which cap is fitted, the joints between these latter parts being of a profile that prevents any movement of cap when in service.

11 inches diameter and larger having parallel arms with webs built into the rim with rim segments, the webs forming an additional tie between rim and arms and also supporting the rim at right angles to parallel arms.

Nominal Width Face, Inches

Diameter Inches	3	4	5	6	8	10	12	14	16	18	20	22	24
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
4	$2.80	$2.90	$3.10	$3.30	$3.70	$4.10	$4.50	.....	.....	.....	.....	.....	.....
5	2.85	2.95	3.20	3.40	3.85	4.30	4.75	.....	.....	.....	.....	.....	.....
6	2.90	3.00	3.25	3.50	4.00	4.50	5.00	.....	.....	.....	.....	.....	.....
7	2.95	3.05	3.35	3.60	4.15	4.70	5.25	$5.80	.....	.....	.....	.....	.....
8	3.00	3.10	3.40	3.70	4.30	4.90	5.50	6.10	.....	.....	.....	.....	.....
9	3.10	3.25	3.60	3.90	4.55	5.20	5.85	6.50	.....	.....	.....	.....	.....
10	3.25	3.40	3.75	4.10	4.80	5.50	6.20	6.90	$7.60	.....	.....	.....	.....
11	3.50	3.70	4.10	4.50	5.30	6.10	6.90	7.70	8.50	.....	.....	.....	.....
12	3.75	4.00	4.45	4.90	5.80	6.70	7.60	8.50	9.40	$10.30	.....	.....	.....
13	.....	4.30	4.80	5.30	6.30	7.30	8.30	9.30	10.30	11.30	.....	.....	.....
14	.....	4.60	5.15	5.70	6.80	7.90	9.00	10.10	11.20	12.30	$13.40	.....	.....
15	.....	4.90	5.50	6.10	7.30	8.50	9.70	10.90	12.10	13.30	14.50	.....	.....
16	.....	5.20	5.85	6.50	7.80	9.10	10.40	11.70	13.00	14.30	15.00	$16.90	.....
17	.....	5.50	6.20	6.90	8.30	9.70	11.10	12.50	13.90	15.30	16.70	18.10	.....
18	.....	5.80	6.55	7.30	8.80	10.30	11.80	13.30	14.80	16.30	17.80	19.30	$20.80
19	.....	6.10	6.90	7.70	9.30	10.90	12.50	14.10	15.70	17.30	18.90	20.50	22.10
20	.....	6.40	7.25	8.10	9.80	11.50	13.20	14.90	16.60	18.30	20.00	21.70	23.40
22	.....	7.00	7.95	8.90	10.80	12.70	14.60	16.50	18.40	20.30	22.20	24.10	26.00
24	.....	7.70	8.80	9.90	12.10	14.30	16.50	18.70	20.90	23.10	25.30	27.50	29.70
26	.....	8.40	9.65	10.90	13.40	15.90	18.40	20.90	23.40	25.90	28.40	30.90	33.40
28	.....	9.10	10.50	11.90	14.70	15.50	20.30	23.10	25.90	28.70	31.50	34.30	37.10
30	.....	9.80	11.35	12.90	16.00	19.10	22.20	25.30	28.40	31.50	34.60	37.70	40.80
32	.....	10.50	12.20	13.90	17.30	20.70	24.10	27.50	30.90	34.30	37.70	41.10	44.50
34	.....	11.30	13.15	15.00	18.70	22.40	26.10	29.80	33.50	37.20	40.90	44.60	48.30
36	.....	12.10	14.10	16.10	20.10	24.10	28.10	32.10	36.10	40.10	44.10	48.10	52.10
38	.....	.....	.....	17.20	21.50	25.80	30.10	34.40	38.70	43.00	47.30	51.60	55.90
40	.....	.....	.....	18.30	22.90	27.50	32.10	36.70	41.30	45.90	50.50	55.10	59.70
42	.....	.....	.....	19.60	24.60	29.60	34.60	39.60	44.60	49.60	54.60	59.60	64.60
44	.....	.....	.....	20.90	26.30	31.70	37.10	42.50	47.00	53.30	58.70	54.10	69.50
46	.....	.....	.....	22.30	28.10	31.90	39.70	45.50	51.30	57.10	62.90	68.70	74.50
48	.....	.....	.....	23.80	30.00	36.20	42.40	48.60	54.80	61.00	67.20	73.40	79.60
50	.....	.....	.....	25.40	32.00	38.60	45.20	51.80	58.40	65.00	71.60	78.20	84.80
52	.....	.....	.....	27.10	34.10	41.10	48.10	55.10	62.10	69.10	76.10	83.10	90.10
54	.....	.....	.....	28.90	36.30	43.70	51.10	58.50	65.90	73.30	80.70	88.10	95.50
56	.....	.....	.....	30.80	38.60	46.40	54.20	62.00	69.80	77.60	85.40	93.20	101.00
58	.....	.....	.....	32.80	41.00	49.20	57.40	65.60	73.80	82.00	90.20	98.40	106.60
60	.....	.....	.....	34.90	43.50	52.10	60.70	69.30	77.90	86.50	95.10	103.70	112.30
62	.....	.....	.....	37.10	46.10	55.10	64.10	73.10	82.10	91.10	100.10	109.10	118.10
64	.....	.....	.....	39.40	48.80	58.20	67.60	77.00	86.40	95.80	105.20	114.60	124.00
66	.....	.....	.....	41.90	51.80	61.70	71.60	81.50	91.40	101.30	111.20	121.10	131.00
68	.....	.....	.....	44.50	54.90	65.30	75.70	86.10	96.50	106.90	117.30	127.70	138.10
70	.....	.....	.....	47.20	58.10	69.00	70.90	90.80	101.70	112.60	123.50	134.40	145.30
72	.....	.....	.....	50.00	61.40	72.80	84.20	95.60	107.00	118.40	129.80	141.20	152.60
78	.....	.....	.....	.....	71.90	84.80	97.70	110.60	123.50	136.40	149.30	162.20	175.10
84	.....	.....	.....	.....	83.30	97.70	112.10	126.50	140.90	155.30	169.70	184.10	198.50
90	.....	.....	.....	.....	95.60	111.50	127.40	143.30	159.20	175.10	191.00	206.90	222.80
96	.....	.....	.....	.....	109.00	126.50	144.00	161.50	179.00	196.50	214.00	231.50	249.00
102	.....	.....	.....	.....	123.70	143.00	162.30	181.60	200.90	220.20	239.50	258.80	278.10
108	.....	.....	.....	.....	139.30	160.40	181.50	202.60	223.70	244.80	265.90	287.00	308.10
114	.....	.....	.....	.....	155.80	178.70	201.60	224.50	247.40	270.30	293.20	316.10	339.00
120	.....	.....	.....	.....	173.20	197.90	222.60	247.30	272.00	296.70	321.40	346.10	370.80

To obtain list price of paper mill type wood pulleys, add 20 per cent to list prices of regular wood pulleys.

WOOD SPLIT PULLEYS

FAIRBANKS

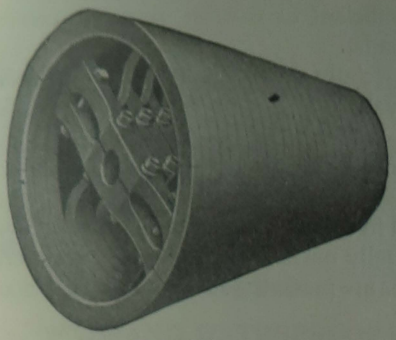


Fig. 1811

TAPER CONE PULLEYS

NO. T–457

Use list for largest diameter and full width of face, and add 25 per cent. to make total list.

If face exceeds widest size listed, extend the list at the same rate per inch as that existing between last two sizes listed, and add 25 per cent.

STEP CONE PULLEYS

NO. T–456

Treat each step as a separate pulley, combine the list and add 50 per cent.

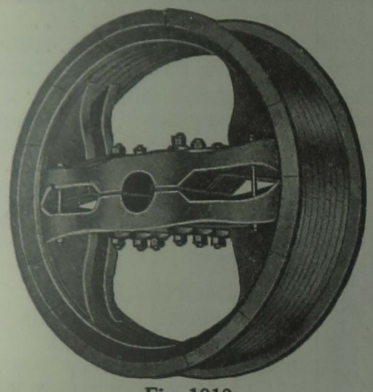


Fig. 1813

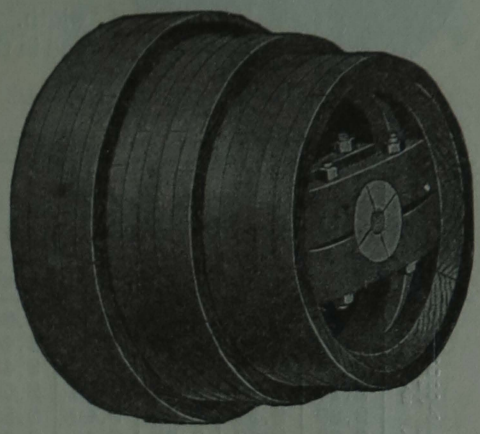


Fig. 1812

FLANGE PULLEYS

NO. T–455

For flange pulleys, add to regular list for a single flange, 20 per cent.; for a double flange, 25 per cent., and for a triple flange, 30 per cent.

WOOD BUSHINGS

One complete bushing to fit shaft and of length required by pulley hub is furnished with each pulley without charge.

Extra or Separate Bushing.—10 inches or less of complete bushing, list price, 50 cents.

More than 10 inches or Complete Bushing.—List price, 5 cents per inch.

Odd Diameters.—When in fractions of an inch or odd inches not listed, use list of next larger diameter—for example, a 33-inch pulley takes 34-inch list.

Odd Faces.—When face widths are ordered in fractions of an inch or in odd inches not listed, use the list price of the next wider face.

Offset Hubs.—When pulleys are ordered with hub offset, add 10 per cent to the final list price.

Keyseating Hubs.—When it is desired to have pulleys furnished with the hubs keyseated, it is customary to have the pulleys made to order and bored to shaft size. Note extras for boring to shaft size and the following extras for Keyseating.

Shaft Size, Inches	Width of Face, Inches			
	12 or Less Each	13-16 Each	17-20 Each	21-24 Each
3 or less	$1.25	$1.75	$2.35	$3.00
3 1/16–3 1/2	1.30	1.80	2.45	3.10
3 9/16–4	1.50	2.00	2.70	3.35
4 1/16–4 1/2	2.00	2.50	3.00	3.50
4 9/16–5	2.35	3.00	3.70	4.35
5 1/16–6	3.00	3.75	4.50	5.35
6 1/16–7	3.75	4.50	5.25	6.10

These pulleys are turned concentric with bore and carefully balanced which insures true running.

SPECIAL BORES

For boring pulleys to fit shaft when bore is less than standard, or for boring pulleys larger than standard, but smaller than bores shown in the following table, add 10 per cent to regular list.

Dia., Inches	Add to List					
	15%	20%	25%	35%	50%	65%
	Bore, Inches					
Under 12	3 9/16 to 4	4 1/16 to 5	5 1/16 to 6			
From 12 to 48	4 1/16 to 4 1/2	4 9/16 to 6	6 1/16 to 7 1/2	7 9/16 to 10		
From 49 to 72	6 1/16 to 6	6 1/16 to 7 1/2	7 9/16 to 9 1/2	9 9/16 to 12	12 1/16 to 15	15 1/16 to 18
From 73 to 96	7 1/16 to 8	8 1/16 to 10	10 1/16 to 12	12 1/16 to 15	15 1/16 to 18	18 1/16 to 21
From 97 to 120	9 1/16 to 10	10 1/16 to 12	12 9/16 tp 15	15 1/16 to 18	18 1/16 to 21	21 1/16 to 25

Where it is required that wood pulleys run loose on shaft, as in a pair of tight and loose pulleys, they may be fitted with solid or split cast iron bushings.

PAPER PULLEYS

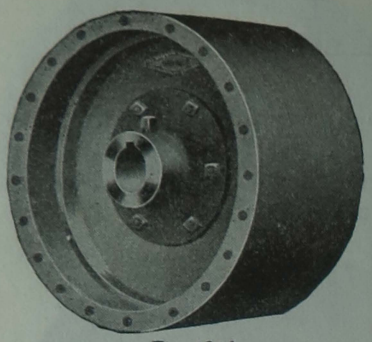


Fig. 1814

Paper pulleys show an extremely high coefficient of friction, transmit power smoothly and successfully, resist heavy shock loads.

Owing to these characteristics they are especially adapted for use on all types of high speed machinery and are used extensively where extremely high belt efficiency is necessary.

They are well proportioned, perfectly balanced and neat in finish; turned both inside and outside.

All standard patterns have hubs central and in length equal to two-thirds of face width. When the widths of the faces are unusually narrow for the given diameters and in the smaller sizes of motor pulleys, the hubs are made the full width of the face.

NO. T-458

Dia. Inches	Face Widths, Inches														
	2	3	4	5	6	7	8	9	10	11	12	14	16	18	20
	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each	Each
2	$2.00	$2.05	$2.10	$2.20	$2.35	....	....	....	....	....	....	....	....	....	....
2½	2.05	2.10	2.15	2.25	2.40	....	....	....	....	....	....	....	....	....	....
3	2.10	2.15	2.20	2.30	2.45	$2.65	....	....	....	....	....	....	....	....	....
3½	2.15	2.20	2.25	2.35	2.50	2.70	$2.95	....	....	....	....	....	....	....	....
4	2.20	2.25	2.30	2.40	2.55	2.75	3.00	....	....	....	....	....	....	....	....
4½	2.25	2.30	2.35	2.45	2.60	2.80	3.05	$3.35	....	....	....	....	....	....	....
5	2.30	2.35	2.40	2.50	2.65	2.85	3.10	3.40	$3.75	....	....	....	....	....	....
5½	2.35	2.40	2.45	2.55	2.70	2.90	3.15	3.45	3.80	....	....	....	....	....	....
6	....	3.05	3.15	3.25	3.45	3.70	4.00	4.40	4.80	$5.30	....	....	....	....	....
7	....	3.20	3.25	3.40	3.55	3.80	4.15	4.50	4.95	5.45	$6.00	....	....	....	....
8	....	3.40	3.45	3.55	3.75	4.00	4.30	4.70	5.10	5.60	6.20	....	....	....	....
9	....	3.55	3.65	3.75	3.95	4.20	4.50	4.90	5.30	5.80	6.40	....	....	....	....
10	....	3.75	3.80	3.95	4.15	4.40	4.70	5.05	5.50	6.00	6.55	....	....	....	....
11	....	4.00	4.15	4.30	4.55	4.90	5.25	5.70	6.20	6.75	7.40	....	....	....	....
12	....	4.25	4.45	4.70	5.00	5.40	5.80	6.30	6.90	7.50	8.20	....	....	....	....
13	....	4.50	4.75	5.05	5.45	5.90	6.40	6.95	7.55	8.25	9.00	....	....	....	....
14	....	4.75	5.00	5.30	5.70	6.10	6.60	7.20	7.80	8.50	9.25	....	....	....	....
15	....	5.00	5.30	5.70	6.10	6.60	7.20	7.80	8.50	9.25	10.05	....	....	....	....
16	....	5.30	5.70	6.10	6.60	7.20	7.80	8.50	9.25	10.05	10.95	$12.90	....	....	....
17	....	5.65	6.05	6.55	7.10	7.75	8.45	9.20	10.00	10.90	11.80	13.90	....	....	....
18	....	5.95	6.45	7.00	7.60	8.30	9.05	9.90	10.75	11.70	12.70	14.90	....	....	....
19	....	....	6.75	7.35	7.95	8.65	9.10	10.20	11.05	12.00	13.00	15.20	....	....	....
20	....	....	7.15	7.75	8.45	9.20	10.00	10.90	11.85	12.80	13.90	16.20	....	....	....
21	....	....	7.55	8.25	9.00	9.80	10.70	11.60	12.60	13.70	14.80	17.25	$19.95	....	....
22	....	....	8.00	8.75	9.55	10.45	11.40	12.40	13.45	14.55	15.75	18.30	21.10	....	....
23	....	....	8.45	9.25	10.10	11.05	12.05	13.10	14.25	15.45	16.70	19.40	22.30	....	....
24	....	....	8.80	9.60	10.50	11.45	12.45	13.50	14.60	15.80	17.05	19.75	22.70	....	....
25	....	....	9.25	10.10	11.05	12.05	13.10	14.25	15.45	16.70	18.00	20.80	23.90	....	....
26	....	....	9.75	10.70	11.70	12.45	13.90	15.05	16.30	17.60	19.00	21.95	25.10	....	....
27	....	....	10.25	11.25	12.30	13.45	14.60	15.90	17.20	18.55	20.00	23.05	26.40	$29.95	....
28	....	....	....	11.80	12.95	14.10	15.40	16.70	18.05	19.50	21.00	24.20	27.60	31.30	....
29	....	....	....	12.25	13.40	14.55	15.80	17.10	18.50	19.95	21.45	24.60	28.05	31.75	....
30	....	....	....	12.80	14.00	15.25	16.55	17.95	19.40	20.90	22.45	25.75	29.30	33.15	....
31	....	....	....	13.45	14.60	16.00	17.40	18.80	20.30	21.90	23.50	26.95	30.60	34.55	....
32	....	....	....	14.05	15.40	16.75	18.20	19.70	21.25	22.90	24.55	28.10	31.95	36.00	$40.30
33	....	....	....	14.70	16.05	17.50	19.00	20.55	22.20	23.90	25.60	29.30	33.25	37.45	41.90
34	....	....	....	15.20	16.55	18.00	19.50	21.05	22.70	24.40	26.10	29.80	33.75	37.95	42.40
35	....	....	....	15.80	17.25	18.75	20.30	21.95	23.60	25.40	27.20	31.00	35.05	39.30	43.95
36	....	....	....	16.50	18.00	19.55	21.20	22.90	24.60	26.45	28.20	32.25	36.45	40.90	45.55
37	....	....	....	17.20	18.75	20.50	22.05	23.80	25.65	27.50	29.45	33.50	37.80	42.40	47.20
38	....	....	....	17.90	19.50	21.10	22.95	24.75	26.60	28.55	30.55	34.75	39.20	43.90	48.80
39	....	....	....	18.45	20.05	21.75	23.50	25.30	27.20	29.15	31.15	35.30	39.75	44.45	49.40
40	....	....	....	19.10	20.80	22.55	24.40	26.25	28.20	30.10	32.25	36.55	41.00	46.95	51.00
41	....	....	....	19.90	21.65	23.45	25.30	27.25	29.25	31.30	33.45	37.90	42.55	47.50	52.70
42	....	....	....	20.60	22.45	24.30	26.25	28.25	30.25	32.45	34.60	39.20	44.00	49.05	54.40
43	....	....	....	....	23.25	25.20	27.20	29.25	31.40	33.55	35.80	40.50	45.45	50.65	56.05
44	....	....	....	....	23.90	25.80	27.80	29.90	32.00	34.20	36.45	41.10	46.05	51.25	56.75
45	....	....	....	....	24.70	26.70	28.75	30.90	33.05	35.30	37.65	42.45	47.50	52.80	58.40
46	....	....	....	....	25.55	27.60	29.75	31.95	34.20	36.50	38.90	43.80	49.00	54.45	60.10
47	....	....	....	....	26.45	28.55	30.75	33.00	35.30	37.70	40.15	45.20	50.50	56.05	61.90
48	....	....	....	....	28.55	30.75	33.00	35.30	37.70	40.15	42.65	47.80	53.25	58.95	64.90

Prices of larger sizes than those listed, will be quoted on Application

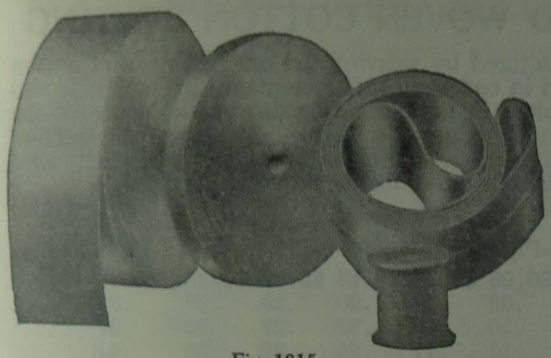


Fig. 1815

FAIRBANKS LEATHER BELTING

FAIRBANKS SPECIAL FIRST QUALITY BRANDS OF LEATHER BELTING

"F" BRAND WATERPROOF—first quality center stock belting. Singles weigh 16 to 18 ounces per square foot. Doubles weigh 29 to 32 ounces per square foot, varying according to width.

"F" BRAND WATERPPROOF PLANER, DOUBLE—weighs 24 to 26 ounces per square foot and can be furnished in sizes 20 inches wide and less. This brand is designed especially for hard drives on high speed machinery where double belting operates over comparatively small diameter pulleys, such as planers, fans, blowers, dynamos and the like, also where the belting is exposed to water or moisture.

"F" BRAND WATERPROOF PLANER, SINGLE, only, weighs 18 to 20 ounces per square foot, and is made in sizes only 4 inches wide and less.

"F" Brand waterproofed leather belting is oil dressed and parts are joined with a high grade waterproofed cement properly applied.

"F" BRAND EXTRA HEAVY SINGLE—is made in sizes not over 6 inches in width and weighs 18 to 20 ounces per square foot. This brand contains nothing but choice extra heavy center stock and is especially well adapted for extra heavy drives where single belting is used.

FAIRBANKS FIRST QUALITY BRANDS OF LEATHER BELTING

"F" BRAND—is heavy, first quality center stock belting, made in all widths and plies. Singles weigh 16 to 18 ounces per square foot. Doubles 29 to 32 ounces per square foot, varying according to width. Nothing but carefully selected heavy first quality leather is used in the construction of this brand.

"VICTOR" BRAND—is medium weight, first quality center stock belting, made in all widths and plies. Singles weigh 14 to 16 ounces per square foot, and doubles from 26 to 28 ounces per square foot. Nothing but carefully selected, medium weight center stock is used in the manufacture of Victor brand.

"F" MOTOR BRAND—is made in doubles only and is first quality center stock, made especially for use on high speed machinery where double belting operates over comparatively small diameter pulleys. It weighs from 22 to 26 ounces per square foot, varying according to width.

FAIRBANKS MEDIUM QUALITY BRANDS OF LEATHER BELTING

"EXTRA SHORT LAP" HEAVY—is made in both singles and doubles in all sizes 6 inches and less, from a selection of side stock. Singles weigh from 16 to 17 ounces per square foot and doubles from 28 to 30 ounces per square foot.

"EXTRA SHORT LAP" MEDIUM—is made in both singles and doubles in all sizes 6 inches and less, from a selection of medium weight side stock. Singles weigh from 14 to 16 ounces per square foot, and doubles from 26 to 28 ounces per square foot.

As a guide for minimum pulley diameters in inches to use with leather belting the following is suggested:

"Brand" and Weight per Square Foot	Velocity in Feet per Minute			"Brand" and Weight per Square Foot	Velocity in Feet per Minute		
	Not Greater than 1000	Not Greater than 2000	3000 and Greater		Not Greater than 1000	Not Greater than 2000	3000 and Greater
"F" Brand Double 29 to 32 Ounces	12	13½	14	"F" Brand Single 16 to 18 Ounces	4½	5½	6
"Victor" Brand Double 26 to 28 Ounces	7¼	8½	9	"Victor" Brand Single 14 to 16 Ounces	3¼	4¼	4¾

For smaller diameter pulleys it is advisable to use thinner and lighter weight belts, oil dressed if necessary.

Width, Inches	Per Foot Single	Per Foot Double	Width, Inches	Per Foot Single	Per Foot Double	Width, Inches	Per Foot Single	Per Foot Double	Width, Inches	Per Foot Single	Per Foot Double
½	$0.12	$0.24	4	$0.96	$1.92	17	$4.08	$8.16	36	$8.64	$17.28
⅝	.15	.30	4½	1.08	2.16	18	4.32	8.64	38	9.12	18.24
¾	.18	.36	5	1.20	2.40	19	4.56	9.12	40	9.60	19.20
⅞	.21	.42	5½	1.32	2.64	20	4.80	9.60	42	10.08	20.16
1	.24	.48	6	1.44	2.88	21	5.04	10.08	44	10.56	21.12
1¼	.30	.60	6½	1.56	3.12	22	5.28	10.56	46	11.04	22.08
1½	.36	.72	7	1.68	3.36	23	5.52	11.04	48	11.52	23.04
1¾	.42	.84	8	1.92	3.84	24	5.76	11.52	50	12.00	24.00
2	.48	.96	9	2.16	4.32	25	6.00	12.00	52	12.48	24.96
2¼	.54	1.08	10	2.40	4.80	26	6.24	12.48	54	12.96	25.92
2½	.60	1.20	11	2.64	5.28	27	6.48	12.96	56	13.44	26.88
2¾	.66	1.32	12	2.88	5.76	28	6.72	13.44	60	14.40	28.80
3	.72	1.44	13	3.12	6.24	29	6.96	13.92	64	15.36	30.72
3¼	.78	1.56	14	3.36	6.72	30	7.20	14.40	68	16.32	32.64
3½	.84	1.68	15	3.60	7.20	32	7.68	15.36	72	17.28	34.56
3¾	.90	1.80	16	3.84	7.68	34	8.16	16.32			

RUBBER BELTINGS

FAIRBANKS HEAVY DUTY

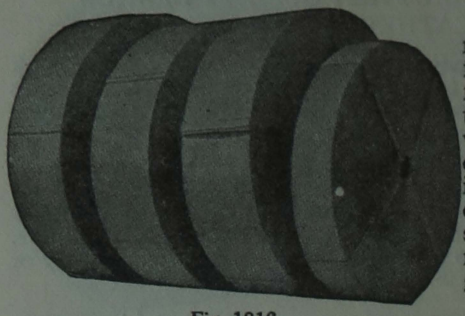


Fig. 1816

An extra heavy red friction surface belt suitable for the hardest transmission service, constructed of 36 ounce specially woven duck of great tensile strength impregnated with a high grade rubber friction. Beneath the outer plies there is an extra gum cushion which gives greater flexibility, excludes moisture and protects the belt from injury when loads are suddenly applied.

FRICTION BRAND—A very high grade friction surface belt adapted for all standard transmission service such as main and auxiliary drives. It is made of 32 ounce duck, also of a special weave and has an extra quality of rubber friction between the plies. This brand possesses great strength and is unusually flexible. It has minimum stretch and will run straight and true on the pulleys.

HIGH SPEED—A friction surface belt made specially for high speed service on small diameter pulleys. Built of light weight hard woven duck with an exceptionally high grade of rubber friction between the plies. It is very pliable and equals in strength belts made from heavier weight, softer woven duck.

Width, Inches	Per Lineal Foot 2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply
1	$0.18	$0.20	$0.24	....	....	....	....
1¼	.23	.26	.30	....	....	....	....
1½	.27	.31	.36	$0.45	....	....	....
1¾	.32	.36	.42	.53	....	....	....
2	.34	.39	.46	.58	$0.69	....	....
2½	.42	.48	.56	.70	.84	....	....
3	.48	.55	.65	.81	.98	....	....
3½	.57	.65	.76	.95	1.14	....	....
4	.61	.70	.82	1.03	1.23	$1.44	....
4½	....	.78	.92	1.15	1.38	1.61	....
5	....	.87	1.02	1.28	1.53	1.79	....
6	....	1.04	1.22	1.53	1.83	2.14	$2.44
7	....	1.22	1.43	1.79	2.15	2.50	2.86
8	....	1.31	1.54	1.93	2.31	2.70	3.08
9	....	....	1.73	2.16	2.60	3.03	3.46
10	....	....	1.92	2.40	2.88	3.36	3.84
11	....	....	2.11	2.64	3.17	3.69	4.22
12	....	....	2.30	2.88	3.45	4.03	4.60
13	....	....	2.50	3.13	3.75	4.38	5.00
14	....	....	2.69	3.36	4.04	4.71	5.38
15	....	....	2.88	3.60	4.32	5.04	5.76
16	....	....	3.08	3.86	4.62	5.40	6.16
18	....	....	3.46	4.32	5.20	6.06	6.92
20	....	....	3.84	4.80	5.76	6.72	7.68
22	....	....	4.22	5.28	6.34	7.38	8.44
24	....	....	4.60	5.76	6.90	8.06	9.20
26	....	....	....	6.26	7.50	8.76	10.00
28	....	....	....	6.72	8.08	9.42	10.76
30	....	....	....	7.20	8.64	10.08	11.52
32	....	....	....	7.72	9.24	10.80	12.32
34	....	....	....	8.18	9.82	11.46	13.08
36	....	....	....	8.64	10.40	12.12	13.84
38	....	....	....	....	10.96	12.78	14.60
40	....	....	....	....	11.52	13.44	15.36
42	....	....	....	....	12.10	14.10	16.12
44	....	....	....	....	12.68	14.76	16.88
46	....	....	....	....	13.24	15.44	17.64
48	....	....	....	....	13.80	16.12	18.40

Rubber belting may be compared with leather on the following basis, viz.: 4-ply heavy single, 6-ply heavy double, 10-ply triple.

SOLID WOVEN COTTON BELTING

Manufactured by weaving the several layers of cotton yarn solid in one body. It is made up without laps and care is taken in both the selection and weaving of the yarns, thus producing a perfectly true running belt of uniform thickness. Belts of this kind are largely used with bucket elevators for handling light material.

Width, Inches	Per Lineal Foot 2-Ply	3-Ply	4-Ply	5-Ply	6-Ply	8-Ply	10-Ply
1	$0.08	$0.13	$0.18	$0.22	$0.25	$0.29	....
1	.09	.14	.20	.25	.28	.33	....
1	.10	.16	.22	.27	.32	.37	....
1	.11	.17	.24	.30	.35	.41	....
2	.13	.19	.26	.32	.39	.45	....
2	.14	.21	.28	.34	.42	.49	....
2	.15	.23	.30	.37	.45	.53	....
3	.18	.26	.34	.42	.52	.67	....
3	.20	.29	.38	.50	.58	.77	....
4	.23	.32	.42	.57	.64	.87	....
4	.25	.36	.46	.64	.75	.97	....
5	.28	.39	.50	.70	.84	1.07	....
5	.30	.42	.54	.76	.92	1.17	....
6	.32	.45	.58	.81	1.00	1.27	....
6	.34	.48	.63	.87	1.07	1.37	....
7	.36	.51	.68	.94	1.14	1.50	....
8	.43	.59	.78	1.08	1.35	1.77	....
9	.53	.73	.94	1.23	1.52	2.15	$2.46
10	.60	.83	1.08	1.39	1.74	2.53	2.78
12	.68	.93	1.25	1.68	2.06	2.90	3.36
14	.79	1.07	1.45	1.94	2.42	3.30	3.90
16	.90	1.24	1.69	2.21	2.62	3.70	4.42
18	1.01	1.41	1.93	2.49	2.95	4.10	4.98
20	1.11	1.62	2.17	2.75	3.32	4.48	5.50
22	1.21	1.84	2.40	3.15	3.77	5.08	6.30
24	1.30	2.05	2.64	3.44	4.13	5.67	6.88
26	1.40	2.25	2.87	3.73	4.59	6.07	7.46
28	1.50	2.44	3.13	4.06	4.96	6.47	8.12
30	1.65	2.65	3.41	4.34	5.45	6.91	8.68
32	1.80	2.86	3.67	4.67	5.93	7.57	9.34
34	1.95	3.01	3.91	4.98	6.36	8.23	9.96
36	2.10	3.18	4.11	5.28	6.64	8.75	10.56
38	2.26	3.36	4.36	5.67	7.08	9.27	11.34
40	2.40	3.53	4.66	6.00	7.36	9.64	12.00
42	2.54	3.75	4.94	6.40	7.75	10.27	12.80
44	2.70	3.93	5.20	6.80	8.10	10.75	13.60
46	2.85	4.10	5.51	7.18	8.68	11.12	14.36
48	3.00	4.28	5.82	7.56	9.27	11.49	15.12

IMPREGNATED

Thoroughly impregnated with a special compound which lubricates all fibres and produces a belt that is waterproof, that is unaffected by extreme heat, alkali or acid fumes, and that is not injured by grease, oil, gases, etc.

Width, Inches	Per Lineal Foot Single	Double	Triple	Width, Inches	Per Lineal Foot Single	Double	Triple
1	$0.28	....	....	5½	$1.54	$2.20	$....
1¼	.35	....	....	6	1.68	2.40	3.12
1½	.42	$0.60	....	6½	1.82	2.60	....
1¾	.49	.70	....	7	1.96	2.80	3.64
2	.56	.80	....	8	2.24	3.20	4.16
2¼	.63	.90	....	9	2.52	3.60	4.68
2½	.70	1.00	....	10	2.80	4.00	5.20
2¾	.77	1.10	....	12	3.36	4.80	6.24
3	.84	1.20	....	14	3.92	5.60	7.28
3¼	.91	1.30	....	16	....	6.40	8.32
3½	.98	1.40	....	18	....	7.20	9.36
4	1.12	1.60	$2.08	20	....	8.00	10.40
4½	1.26	1.80	....	22	....	8.80	11.44
5	1.40	2.00	....	24	....	9.60	12.48

FOR GREATER WIDTHS

	Double	Triple
Add per Inch of Width	$0.40	$0.52

Single equals 4-ply canvas or rubber and single leather.
Double equals 6-ply canvas or rubber and double leather.
Triple equals 10-ply canvas or rubber and triple leather.

CANVAS STITCHED BELTING

Made of cotton duck closely woven on special heavy looms, built exclusively for the purpose. The duck for each size belt is made exact width necessary, with two selvage edges, thus insuring a uniform resistance to stretch. All widths are machine folded, which eliminates the possibility of hollow edges in finished belt.

List Prices per Lineal Foot

Width, Inches	4-Ply	5-Ply	6-Ply	8-Ply	10-Ply
1	$0.20	.....	.....	.....	.....
1½	.30	.....	.....	.....	.....
2	.39	$0.49	$0.59	.....	.....
2½	.48	.60	.72	.....	.....
3	.57	.71	.86	.....	.....
3½	.65	.81	.98	.....	.....
4	.74	.93	1.11	$1.48	.....
4½	.81	1.01	1.22	1.62	.....
5	.90	1.13	1.35	1.80	.....
6	1.05	1.31	1.58	2.10	.....
7	1.20	1.50	1.80	2.40	.....
8	1.35	1.69	2.03	2.70	.....
9	1.49	1.86	2.24	2.98	.....
10	1.62	2.03	2.43	3.24	.....
11	1.76	2.20	2.64	3.52	.....
12	2.05	2.57	3.08	4.10	$5.13
13	2.15	2.69	3.23	4.30	5.37
14	2.31	2.90	3.47	4.62	5.78
15	2.48	3.09	3.72	4.96	6.20
16	2.64	3.30	3.96	5.28	6.60
18	2.97	3.72	4.46	5.94	7.43
20	3.30	4.13	4.95	6.60	8.25
22	3.63	4.55	5.45	7.26	9.08
24	3.96	4.95	5.94	7.92	9.90
26	4.68	5.85	7.02	9.36	11.70
28	5.04	6.30	7.56	10.08	12.60
30	5.40	6.75	8.10	10.80	13.50
32	5.76	7.20	8.64	11.52	14.40
34	6.12	7.65	9.18	12.24	15.30
36	6.48	8.10	9.72	12.96	16.20
38	7.41	9.27	11.12	14.82	18.53
40	7.80	9.75	11.70	15.60	19.50
42	8.19	10.25	12.29	16.38	20.48
44	8.58	10.73	12.87	17.16	21.45
46	8.97	11.22	13.46	17.94	22.43
48	9.36	11.70	14.04	18.72	23.40

Sizes not listed take price of nearest higher size.

Charge for splice on endless belts: All belts 16 inches wide and under, seven feet is the minimum charge. Belts over 16 inches wide, the charge is to be the equivalent of five times the width of the belt. We make belts up to 54 inch width.

LEATHER SHAFTING RINGS

For the purpose of keeping line shafting in a perfectly clean condition.

They weave back and forth as the shaft revolves and prevent the accumulation of lint, dirt, rust and excess oil and also indicate whether shafting is level or not, as they will not travel along shaft if it is not absolutely level.

One ring should be used for each open space on shaft less than 18 inches, and at least two rings for longer distances.

Shaft Size, Inches	Each	Shaft Size, Inches	Each
1 7/16	$0.28	2 11/16	$0.44
1 11/16	.31	2 15/16	.48
1 13/16	.34	3 3/16	.52
2 3/16	.37	3 7/16	.56
2 7/16	.41	3 11/16	.61
		3 15/16	.65

BALATA BELTING

Fairbanks "F" brand balata belting is manufactured from extra heavy 40 ounce cotton duck, which is woven on special looms under high tension, thereby eliminating all undesirable stretch. It is impregnated with a balata solution by a special process, which results in the highest obtainable friction and durability.

List Prices per Lineal Foot

Width, Inches	3-Ply	4-Ply	5-Ply	6-Ply	7-Ply	8-Ply	10-Ply
1	$0.18	$0.24	$0.30	....	....	....	....
1¼	.23	.30	.38	....	....	....	....
1½	.27	.36	.45	....	....	....	....
1¾	.32	.42	.53	$0.63	....	....	....
2	.36	.48	.60	.72	....	....	....
2¼	.41	.54	.68	.81	....	....	....
2½	.45	.60	.75	.90	....	....	....
2¾	.50	.66	.83	.99	....	....	....
3	.54	.72	.90	1.08	....	....	....
3¼	.59	.78	.98	1.17	....	....	....
3½	.63	.84	1.05	1.26	....	....	....
3¾	.68	.90	1.13	1.35	....	....	....
4	.72	.96	1.20	1.44	....	....	....
4¼	.77	1.02	1.28	1.53	....	....	....
4½	.81	1.08	1.35	1.62	....	....	....
4¾	.86	1.14	1.43	1.71	....	....	....
5	.90	1.20	1.50	1.80	....	....	....
5½	.99	1.32	1.65	1.98	....	....	....
6	1.08	1.44	1.80	2.16	$2.52	$2.88	....
6½	1.17	1.56	1.95	2.34	2.73	3.12	....
7	1.26	1.68	2.10	2.52	2.94	3.36	....
8	1.44	1.92	2.40	2.88	3.36	3.84	$4.80
9	1.62	2.16	2.70	3.24	3.78	4.32	5.40
10	1.80	2.40	3.00	3.60	4.20	4.80	6.00
11	1.98	2.64	3.30	3.96	4.62	5.28	6.60
12	2.16	2.88	3.60	4.32	5.04	5.76	7.20
13	....	....	3.90	4.68	5.46	6.24	7.80
14	....	....	4.20	5.04	5.88	6.72	8.40
15	....	....	4.50	5.40	6.30	7.20	9.00
16	....	....	4.80	5.76	6.72	7.68	9.60
18	....	....	5.40	6.48	7.56	8.64	10.80
20	....	....	6.00	7.20	8.40	9.60	12.00
22	....	....	6.60	7.92	9.24	10.56	13.20
24	....	....	7.20	8.64	10.08	11.52	14.40

Other widths and plies at proportionate prices.

For endless belts charge 3 feet extra up to 12 inches wide. 4 feet, extra from 13 inch to 20 inch widths. Wider sizes in proportion. Widths below 1 inch at list price for 1 inch. 2-ply belts at list price for 3-ply.

ROUND LEATHER BELTING

The same stock and careful supervision enters into the manufacture of our round belt as in our various brands of flat leather belting. Prices of patent solid round and twist round belting shown in list below.

Prices of round leather belting 1/8 to 3/8 inch diameters, inclusive, both regular and full sizes, will be quoted upon application.

CUT LACE	ROUND BELTING — Solid		ROUND BELTING — Twist	
Width, Inches	100 Feet	Width, Inches	Lineal Foot	Width, Inches	Lineal Inches
1/4	$2.50	7/16	$0.36	1/8	$0.08
5/16	3.00	1/2	.38	3/16	.12
3/8	3.75	5/8	.48	1/4	.17
7/16	4.50	1/8	.60	5/16	.22
1/2	5.50	7/8	.80	7/8	.27
5/8	6.50	1	.96	1/2	.38
3/4	7.50	1 1/8	1.10	5/8	.48
7/8	9.50	1 1/4	1.15	3/4	.60
1	11.00	1 1/2	1.40	7/8	.80
				1	.96

CHAIN ELEVATORS AND CONVEYORS

For conveying all kinds of finished and unfinished products such as barrels, bags, coal and ashes. Used in mills and factories, foundries, mines, glass works, gas producer plants, flour mills, glue factories, ice plants, cement mills, chemica works, coal and coke, and other plants having material to load, unload or convey.

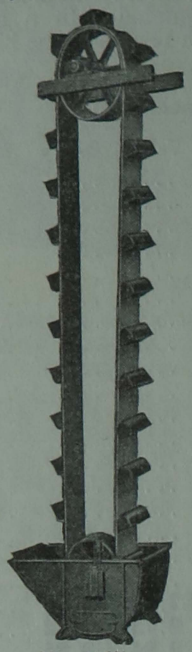


Fig. 1817
NO. T-491

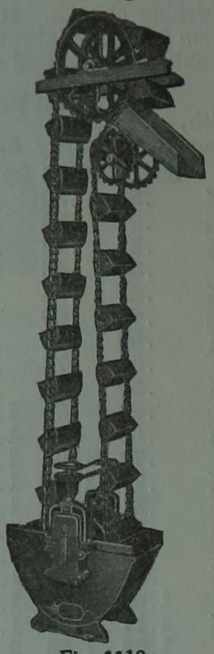


Fig. 1118
NO. T-493

Bucket Elevators

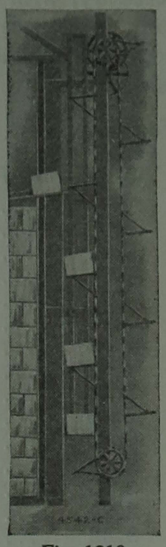


Fig. 1819
NO. T-498

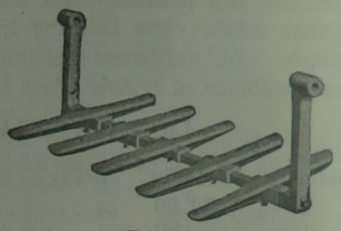


Fig. 1820
NO. T-496

Fig. 1821
NO. T-497

Tray and Arm Elevators

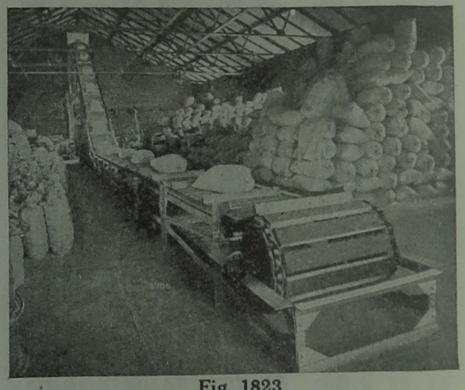


Fig. 1823
NO. T-502—Apron Conveyors for Steep Inclines

Fig. 1822
NO. T-500—Barrel Elevators

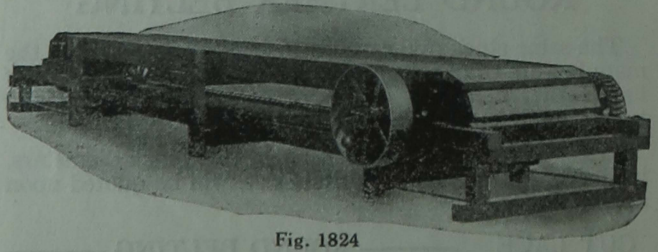


Fig. 1824
NO. T-505—Short Apron Conveyors

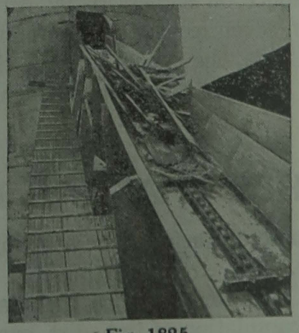


Fig. 1825
NO. T-515—Refuse Conveyors

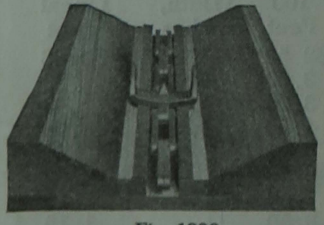


Fig. 1826

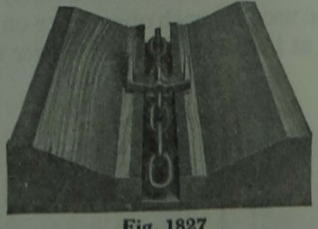


Fig. 1827

NO. T-518—Lumber and Log Conveyors—NO. T-519

MALLEABLE DETACHABLE LINK CHAINS

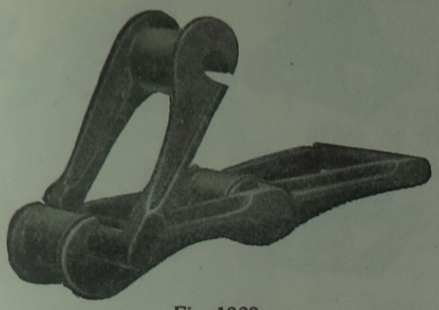


Fig. 1828

Plain Chain

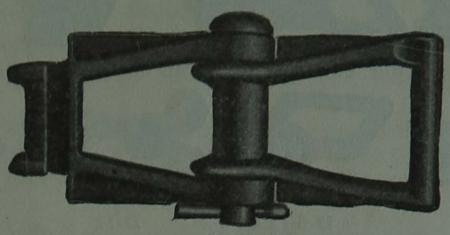


Fig. 1830

Coupler (Pair)

Made of high grade malleable iron, insuring uniform strength, pitch and surface finish. Interchangeable with other makes of standard link chains of corresponding styles and number. Detachable link chains are used for drives with uniform speed, non-gritty conditions and without intermittent shocks; for elevators for conveying light, non-gritty bulk materials in buckets, and for light package, barrel and tray elevators; for conveyors with slots; for scrapers in non-gritty materials and for chains in multiple with or without attachment for package transfer, etc. Support long drives on hardwood guides.

For chains traveling over 100 feet per minute sprocket wheels with not less than 8 teeth, or more than 32 for best results, should be used and with 50 teeth as the limit.

To obtain a chain for a given horse power and speed, multiply the number of horse power by 33,000 and divide by the speed in feet per minute. The result will be the working strength of a chain corresponding to the speed given in table below.

Chain NOS.	Price List				Working Strengths in Lbs.‡—For Speeds in Feet per Minute						
	Approx. Links in 10 Feet	Approx. Weight Per Foot	Plain Chain Per Foot	Couplers Per Pair	150 Ft.	200 Ft.	300 Ft.	400 Ft.	500 Ft.	600 Ft.	700 Ft.
*25	133	.223	$0.15	$0.15	120	114	102	90	78	66	54
*32	104	.343	.16	.16	185	176	157	139	120	102	83
33	86	.322	.15	.15	200	190	170	150	130	110	90
34	86	.402	.17	.17	215	204	183	161	140	118	97
35	74	.402	.18	.18	200	190	170	150	130	110	90
*42	88	.52	.19	.19	250	238	213	188	163	138	113
45†	74	.51	.16	.16	265	252	225	199	172	146	119
50	88	.684	.22	.22	390	363	275	220	176	143	110
51	104	.763	.23	.23	315	299	268	237	205	173	142
*52	80	.85	.23	.23	385	366	327	289	250	212	173
*55†	74	.69	.20	.20	370	352	315	278	241	204	167
57†	52	.89	.24	.24	470	447	400	353	306	259	212
*62	73	1.07	.27	.27	515	489	438	386	335	283	232
66	60	1.22	.32	.32	435	413	370	326	283	239	
67†	52	1.23	.29	.29	555	527	472	416	361	305	
75	46	1.40	.27	.27	670	637	570	503	436	369	
*77†	52	1.45	.32	.32	600	570	510	450	390	330	
*78†	46	2.00	.44	.44	815	774	693	611	530	448	
83	30	1.95	.51	.51	825	784	701	619	536		
85†	30	2.52	.57	.57	1265	1202	1075	949	822		
*88†	46	2.37	.50	.50	960	912	816	720	624	528	
95	30	3.03	.63	.63	1450	1378	1233	1088	943		
*103†	39	4.08	.73	.73	1600	1520	1360	1200	1040		
†104½	26	4.75	.98	.98	1915	1819	1628	1436			
108†	25½	3.45	.75	.75	1650	1568	1403	1238			
*114	37	5.37	.98	.98	1835	1743	1560	1376	1193		
122	20	6.87	1.30	1.30	2500	2375	2125				
*124	30	6.49	1.10	1.10	2125	2009	1798	1586			

Heavy Lines Indicate Speed Limits. Economical Speeds, not over half of these Speed Limits.

Stock Nos. are indicated by bold face type.

*Sizes recommended for transmitting power, used also for conveyors.

†Sizes recommended for elevators and conveyors, used also for drives.

‡For severe service and shock loads use one half of working strengths given in table.

STANDARD ATTACHMENTS FOR DETACHABLE LINK CHAINS

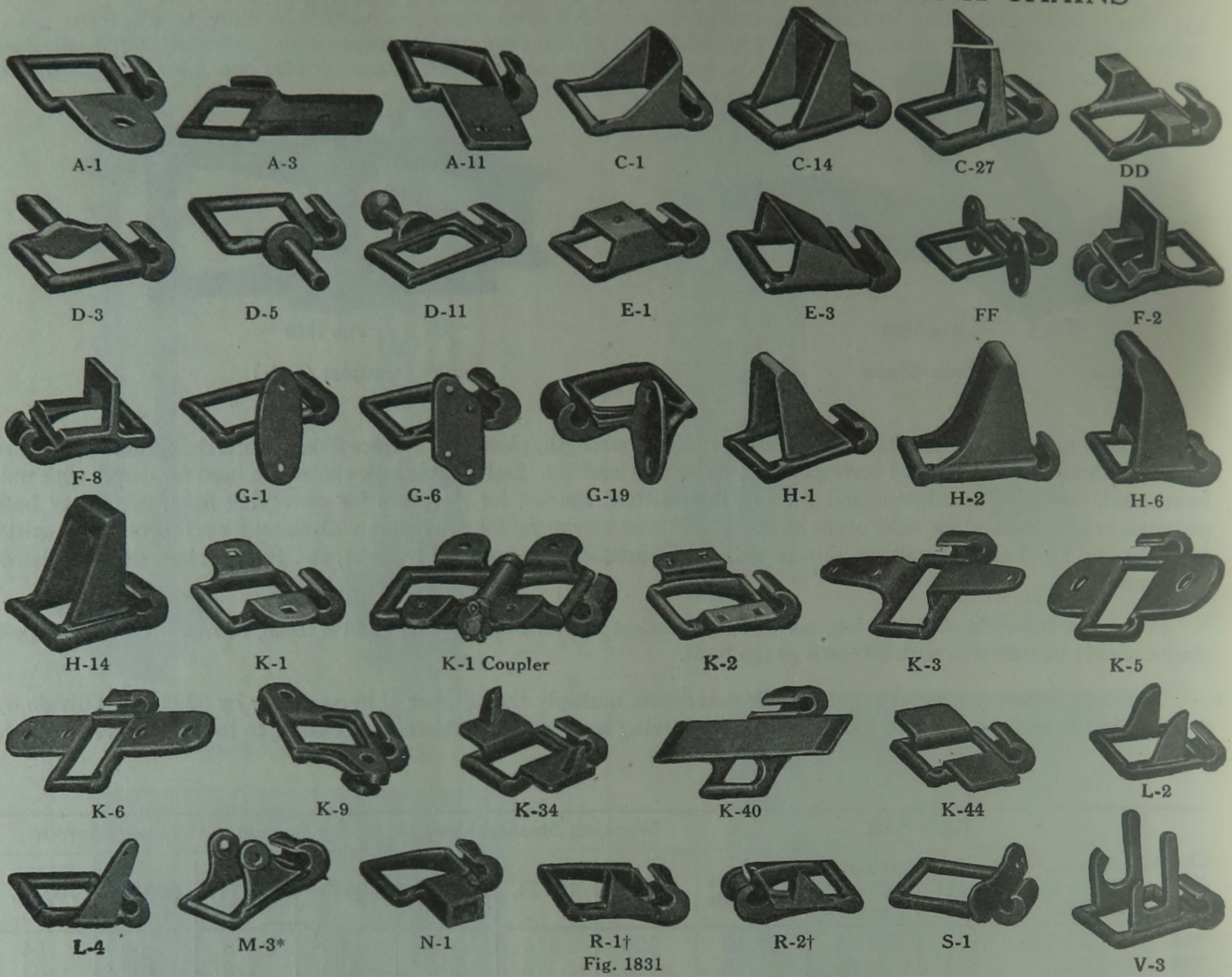


Fig. 1831

*Known a M1 on No. 25, 33, 45 and 55 Chains. †Illustration is left hand, also made right hand.

NO. 25

A-1	**$0.31**
A-3	.46
C-1	**.41**
D-3	.44
E-1	**.45**
G-1	**.45**
H-2	**.32**
K-1	**.37**
M-1	.37
S-1	.40

NO. 32

A-1	**$0.29**
A-3	.36
C-1	**.39**
D-3	.55
E-1	**.27**
G-1	.52
K-1	**.35**
K-5	.42
K-6	.64
M-1	.57

NO. 33

A-1	**$0.26**
E-1	**.25**
K-1	**.33**
K-3	.59
K-5	.43
K-6	.55
M-1	.39
S-1	**.35**

NO. 34

A-1	**$0.31**
C-1	**.36**
C-2	.45
K-1	**.33**

NO. 35

A-1	$0.32
C-1	.34
E-1	.28
K-1	.39
S-1	.36

NO. 42

A-1	**$0.37**
A-3	.65
C-1	**.35**
E-1	.38
G-27	.55
K-1	**.38**
K-3	.75
K-5	.49
K-6	.72
S-1	**.38**

NO. 45

A-1	**$0.31**
A-3	.49
A-14	.46
A-37-LA	.45
C-1	**.32**
C-15	.48
C-27	.55
D-3	.61
D-5	.51
E-1	**.26**
F-2	**.36**
G-1	**.28**
G-27	.46
H-2	.52
K-1 Coupler per pr.	.39
K-1	**.33**
K-3	.64
K-5	.42
K-40	**.53**
K-44	.47
K-45½	1.07
K-48	.60
L-2	.30
M-1	.51
S-1	**.35**
S-5	.51
Scraper No. 22, each	.11
Scraper No. 27, each	.13

NO. 50

K-3½	$0.89

NO. 51

A-1	$0.56
K-1	.60
K-5	.65
S-1	.60

NO. 52

A-1	**$0.41**
A-3	**.46**
C-1	.48
E-1	.50
F-2	**.52**
G-1	.58
K-1	**.42**
K-5	.79
K-9	.47

NO. 55

A-1	**$0.34**
A-2	.47
A-3	.54
C-1	**.37**
C-8, also known as C-5	.56
D-5	.55
E-1	**.37**
F-2	**.41**
G-27	.52
K-1	**.39**
K-5	.49
K-52	.63
L-2	.41
L-21	.37
M-1	.56
S-1	**.37**
S-5	**.40**

NO. 57

A-1	**$0.39**
D-5	.51
E-1	.44
F-2	**.56**

NO. 57—(Con.)

H-2	$0.59
K-1	**.47**

NO. 62

A-1	**$0.46**
A-3	.68
A-12	.64
C-1	**.45**
C-8	.78
D-5	**.60**
G-27	.57
K-1	**.50**
K-5	**.49**
M-17	.76
S-1	**.47**

NO. 66

C-1	$0.58
K-1	.74

NO. 67

A-1	**$0.51**
D-5	**.53**
D-5 with roller ½in.diam	$1.70
E-1	**.47**
F-2	**.58**
G-1	**.59**
K-1	**.52**
K-3	.74

NO. 75

F-2	**$0.63**
G-1	.78
H-1	**.46**
K-1	**.51**
R-1	.47

NO. 77

A-1	**$0.55**
D-5	**.64**
E-1	**.53**
F-2	**.72**
G-1	**.64**
G-6	.70

NO. 77—(Con.)

H-1	**$0.73**
K-1	**.74**
M-3	.83
R-3	**.57**

NO. 78

A-1	$0.75
A-3	.93
A-11	**.65**
D-5	1.24
E-1	.71
F-2	**.80**
G-1	.90
G-6	**.80**
G-19	**.78**
H-1	1.00
H-2	**.88**
K-1	**.66**
M-3	**.94**
R-1	**.50**

NO. 83

D-5	**$0.93**
K-1	**.74**
M-3	**.97**

NO. 85

F-2	**$1.00**
G-6	1.10
K-2	**.86**

NO. 88

A-3	$1.04
A-11, 2 Holes	**.72**
D-5	**.93**
D-K	1.17
E-1	**.87**
F-2	**.90**
F-8	**.94**
G-1	1.00
G-6	**.85**
G-19	**.94**
H-1	**.92**

NO. 88—(Con.)

K-1	**$0.76**
M-3	**1.27**
R-1	**.58**

NO. 95

F-2	**$1.21**
K-2	**.97**

NO. 103

A-4	$1.20
A-11	**1.12**
D-5	1.58
F-2	**1.25**
F-8	**1.40**
G-6	**1.38**
G-19	**1.28**
H-2	1.25
K-1	**1.13**
K-2	**1.18**
L-2	1.80
M-3	**1.38**

NO. 104½

F-2	$1.70
K-2	1.60

NO. 108

F-2	**$1.44**
K-2	**1.24**

NO. 114

DD	$2.26
F-2	2.38
F-8	**2.00**
K-1	**1.40**
K-2	**1.45**

NO. 122

K-2	$2.25

NO. 124

F-2	$2.40
F-8	**2.11**
G-6	**1.83**
K-1	**1.92**

Bold face type indicates stock attachments.

STANDARD CAST-IRON SPROCKET WHEELS

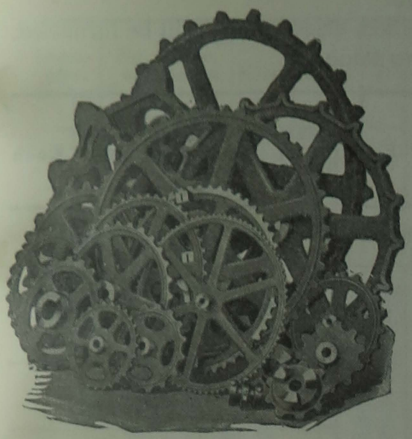


Fig. 1832

NO. T-526

Action of Sprocket Wheels in Chains is as follows:

A driving sprocket (marked DG on castings) is made to transfer power from the wheel to the chain; a driven sprocket (marked DN on casting) to transfer power from the chain to the wheel.

A driving sprocket is ordinarily made slightly larger than an exact fit to the chain, while a driven sprocket is made slightly smaller.

In the case of both driving and driven sprockets one tooth at a time takes the chain pull and transfers it to each successive tooth as the wheel rotates—and this tooth is the one just in the act of leaving the chain.

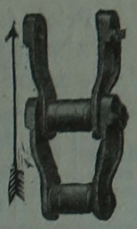


Fig. 1833

Chains of the straight side bar type such as the square shank pin combination type will run over sprockets equally well in either direction, while those of the off-set side bar type as in the detachable malleable roller riveted drive, steel bushed and steel thimble roller chains should operate in following directions.

Run hook or head of the chain in the direction of chain travel for all power drives, all horizontal conveyors and also those vertical and inclined elevators where a drive is taken from the elevator foot shaft.

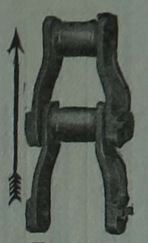


Fig. 1834

Run open end of the chain in the direction of the chain travel for vertical and inclined elevators where the foot shafts run idle. In such cases use ordinary cast-iron driven sprockets (DN) instead of a driving sprocket at the head of the elevators, thus permitting the chains to be engaged by the entering instead of the leaving tooth of the sprockets, thereby greatly reducing external and internal wear of the chain.

Extra Charges to be Added to Standard List Prices For Splitting Cast-Iron Sprocket Wheels, Traction Wheels and Idlers

Pitch Diameter, Inches	Add to List Price	Pitch Diameter, Inches	Add to List Price
1 to and Including 6	70%	Over 24 Including 36	33⅓%
Over 6 " 12	50%	" 36 " 42	30%
" 12 " 18	45%	" 42 " 54	25%
" 18 " 24	40%	" 54	20%

For Bores Larger Than Standard

Maximum Bores, Inches Covered by Regular List	Bores, Inches													
	1 11/16	1 15/16	2 3/16	2 7/16	2 11/16	2 15/16	3 7/16	3 15/16	4 7/16	4 15/16	5 7/16	5 15/16	6 7/16	6 15/16
1 1/16	$0.20	$0.25	$0.50	$0.62	$0.80	$1.12	$1.75	$2.50	.....	.....	.....	.....	.....	.....
1 1/4	.....	.25	.40	.50	.80	1.00	1.62	2.37	$2.90	.....	.....	.....	.....	.....
1 1/8	.....	.....	.25	.37	.60	.90	1.55	2.30	3.12	$4.00	.....	.....	.....	.....
2 1/16	.....	.....	.....	.25	.50	.85	1.60	2.45	3.30	4.30	$5.70	.....	.....	.....
2 1/8	.....	.....	.....	.....	.30	.50	1.40	2.40	3.40	4.50	6.00	$7.30	.....	.....
2 1/4	.....	.....	.....	.....	.....	.50	1.35	2.40	3.50	4.70	6.35	7.70	$10.00	.....
2 1/8	.....	.....	.....	.....	.....	.....	.75	1.95	3.30	4.80	6.30	7.70	10.30	$12 50
3 1/16	.....	.....	.....	.....	.....	.....	.....	1.05	2.70	4.40	6.30	8.50	10.95	13.00
3 1/8	.....	.....	.....	.....	.....	.....	.....	.....	1.35	3.50	5.70	8.20	10.80	14.60
4 1/16	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	3.80	6.30	9.00	11.00
4 1/8	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.80	4.70	7.80	11.20

Larger Hubs Than Standard

Standard Hubs are made fully consistent with bore and strength of chains for ordinary rough working conditions. Service for sudden shocks and starting under full load requires heavier hubs.

Extra charges consistent with extra metal used.

Facing Both Ends of Hubs

List prices of sprocket include facing one end of hub. When it is required that both ends of hub be faced extra charges will be made as follows:

Range of Pitch	Wheels Having Bores						
	To 2 Inches	2 to 3 Inches	3 to 4 Inches	4 to 5 Inches	5 to 6 Inches	6 to 7 Inches	7 to 8 Inches
1 to 15 Inches	$0.50	$0.55	$0.60	$0.70	$0.85	.....	.....
15¼ to 30 Inches	.55	.60	.65	.75	.90	$1.00	.....
30¼ Inches Up	.65	.65	.70	.80	.95	1.10	$1.30

Sprocket wheels can be furnished with plated sides. Plate centers furnished at extra charge of 20 per cent where standard patterns for cast iron as indicated in price lists are made with arms.

Set Screws over Keyways furnished at small extra charge. Either Keyway or Set Screws are included in List Prices.

CAST-IRON SPROCKET WHEELS FOR DETACHABLE LINK CHAINS

Prices for chilled rim steel sprockets and flanged idlers quoted upon application.

Always state which are driving and which driven wheels. If not otherwise specified, driven wheel will be furnished. "A" stands for driving and "B" for driven wheel. When not indicated both kinds are made.

NO. 25

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
1¼	4	⅝	B	$1.60*
1½	5	⅝	B	1.60*
1¾	6	¾		1.60*
2	7	¾		1.60*
2¼	8	1		1.60*
2½	9	1⅛		1.65*
3	10	1¼		1.70*
3¼	11			1.70*
3½	12	1 7/16		1.75*
3¾	13	1 7/16		1.75*
4	14	1 7/16		1.80*
4½	15	1 7/16	B	1.80*
4¾	16	1 7/16		1.85*
5	17	1 7/16		1.90*
5¼	18	1 7/16		1.90*
5¾	20	1 7/16		2.00*
6¼	21	1 7/16		2.05*
6½	22	1 7/16		2.10*
6¾	23	1 7/16	B	2.15
7	24	1 7/16		2.20
7¼	25	1 7/16	B	2.25
7½	26	1 7/16		2.30
7¾	27	1 7/16	B	2.35
8	28	1 7/16		2.40
8¾	30	1 7/16		2.50
10¼	35	1 7/16		2.80
10½	36	1 7/16	B	2.90
11	38	1 7/16	B	3.05
11½	40	1 7/16	B	3.20
11¼	41	1 7/16	B	3.30
12	42	1 7/16		3.35
12½	43	1 7/16	B	3.40
12¾	44	1 7/16	B	3.45
13	45	1 7/16	B	3.55
14	48	1 7/16		3.75
15	52	1 7/16		4.05
16	55	1 7/16	B	4.25
16¼	56	1 7/16		4.35
16½	57	1 7/16	B	4.45
18¾	64	1 7/16		5.00
20¼	70	1 7/16	B	5.50
22¼	77	1 7/16		6.60
24½	84	1 7/16		7.70

NO. 32

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
2	5	⅝	B	$1.65*
2¼	6	¾		1.65*
2½	7	1		1.65*
3	8	1 3/16		1.70*
3½	9	1 7/16	B	1.75*
3¾	10	1 7/16	B	1.80*
4	11	1 7/16		1.85*
4½	12	1 7/16	B	1.90*
5	13	1 7/16	B	1.95*
5¼	14	1 7/16		2.00*
5½	15	1 7/16	B	2.05*
5¾	16	1 7/16		2.10*
6¼	17	1 7/16	B	2.15*
6¾	18	1 7/16	B	2.20
7	19	1 7/16	B	2.25
7½	20	1 7/16		2.30
8	22	1 7/16		2.45
8½	23	1 7/16		2.55
8½	24	1 7/16	B	2.60
9¼	25	1 7/16		2.70
9¾	26	1 7/16	B	2.80
10	27	1 7/16	B	2.85
11¼	30	1 7/16	B	3.15
11¾	32	1 7/16	B	3.30
12	33	1 7/16	B	3.40
12½	34	1 7/16	B	3.50
13¼	36	1 7/16		3.70
14	38	1 7/16	B	3.90
14½	39	1 7/16		4.00

NO. 32—Continued

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
15¼	41	1 7/16		$4.20
16	43	1 7/16	B	4.30
16½	45	1 7/16		4.55
17¾	48	1 7/16	B	4.85
18¼	49	1 7/16		5.00
20½	55	1 7/16	B	5.60
22	59	1 7/16	B	5.90
24	65	1 7/16	B	6.50

NO. 33

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
2½	5	1		$1.70*
2¾	6	1	B	1.70*
3¼	7	1 3/16		1.75*
3¾	8	1 7/16	B	1.80*
4¼	9	1 7/16		1.85*
4¾	10	1 7/16		1.90*
5¼	11	1 7/16		2.00*
5½	12	1 7/16		2.05*
5¾	13	1 7/16	B	2.15*
6¼	14	1 7/16		2.20*
7	15	1 7/16		2.30*
7¼	16	1 7/16		2.40*
8	18	1 7/16		2.50
8½	19	1 7/16		2.60
10	22	1 7/16		2.90
10¾	24	1 7/16	B	3.10
11½	26	1 7/16	B	3.30
12	27	1 7/16		3.45
12½	28	1 7/16	B	3.55
14¼	32	1 7/16		4.00
15¼	34	1 7/16		4.20
16¼	36	1 7/16	B	4.45
17	38	1 7/16		4.70
18½	41	1 7/16		5.05
18 5/8	42	1 7/16		5.15
23¾	53	1 7/16		6.40
24¼	54	1 7/16	B	6.50
30	67	1 7/16		7.80
36	80	1 7/16	B	10.60
36¼	81	1 7/16	B	11.00
40	89	1 7/16	B	12.50
40½	90			13.00

NO. 34

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
3¼	7	1 7/16		$1.75*
4	9	1 7/16		1.85
4½	10	1 7/16	B	1.90*
5½	12	1 7/16		2.05*
5¾	13	1 7/16		2.15*
6¼	14	1 7/16	B	2.20*
		1 7/16	B	
8	18	1 7/16		2.50
10	22	1 7/16	B	2.90
12	27	1 7/16		3.45
16¼	36	1 7/16	B	4.45
20¼	45	1 7/16	B	5.25
24¼	54	1 7/16	B	6.50

NOS. 35, 45, 55

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
2½	4	1	B	$2.00*
2¾	5	1		2.00*
3½	6	1 3/16		2.05*
4	7	1 7/16		2.10*
4¼	8	1 11/16		2.15*
4¾	9	1 15/16		2.20*
5¼	10	1 15/16		2.25*
6	11	1 15/16		2.35*
6½	12	1 15/16		2.40*
7	13	1 15/16		2.50*
7½	14	1 15/16		2.65*

NOS. 35, 45, 55—Continued

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
7¾	15	1 15/16		$2.75*
8¼	16	1 15/16		2.85*
8¾	17	1 15/16		3.00*
9½	18	1 15/16		3.15*
10	19	1 15/16		3.30*
10¼	20	1 15/16	B	3.40*
11	21	1 15/16		3.60*
11½	22	1 15/16	B	3.80
12	23	1 15/16		3.95
12½	24	1 15/16		4.15
13	25	1 15/16	B	4.30
13½	26	1 15/16	B	4.45
14	27	1 15/16		4.65
14½	28	1 15/16		4.85
15¼	29	1 15/16	B	5.00
15¾	30	1 15/16		5.20
16¼	31	1 15/16		5.35
17¾	34	1 15/16	B	5.85
18	35	1 15/16		6.05
18¾	36	1 15/16	B	6.25
19¼	38	1 15/16	B	6.60
20	39	1 15/16	B	6.80
21	40	1 15/16	B	6.95
21¾	42	1 15/16	B	7.30
23	44	1 15/16		7.65
23¼	45	1 15/16		7.85
23¾	46	1 15/16		8.00
24½	47	1 15/16	B	8.20
24¾	48	1 15/16		8.35
26	50	1 15/16	B	8.75
27¾	54	1 11/16		9.50
29½	57	1 15/16		10.10
30	58	1 15/16	B	10.35
31¼	60	1 15/16		10.75
32¼	62	1 15/16		11.20
36½	69	1 15/16		12.85
39¾	76	1 15/16	B	14.50
43	82	1 15/16	B	16.00

NO. 42

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
2½	5	¾	B	$1.85*
2¾	6	¾	B	1.85*
3¼	7	1		1.90*
3¾	8	1 3/16	B	1.95*
4¼	9	1 7/16		2.00*
4½	10	1 7/16		2.05*
4¾	11	1 11/16		2.10*
5¼	12	1 15/16	B	2.15*
5¾	13	1 15/16		2.25*
6¼	14	1 15/16		2.30*
6½	15	1 15/16		2.35*
7	16	1 15/16	B	2.45*
7½	17	1 15/16		2.55*
8	18	1 15/16		2.70*
8¼	19	1 15/16	B	2.80*
8¾	20	1 15/16		2.90
9¼	21	1 15/16	B	3.00
9½	22	1 15/16		3.10
10½	24	1 15/16		3.35
11	25	1 15/16		3.45
11½	26	1 15/16		3.55
11¾	27	1 15/16		3.70
12½	28	1 15/16	B	3.80
12¾	29	1 15/16		3.90
13¼	30	1 15/16	B	4.00
14	32	1 15/16		4.25
14½	33	1 15/16	B	4.40
15¾	36	1 15/16		4.80
17½	40	1 15/16	B	5.30
17¾	41	1 15/16	B	5.45
20	46	1 15/16		6.15
21¾	50	1 15/16		6.75
23	53	1 15/16	B	7.20
24	55	1 15/16	B	7.40
24¾	56	1 15/16	B	7.60

NO. 42—Continued

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
26½	59	1 15/16		$8.50
30	68	1 15/16	B	9.50
36	82	1 15/16	B	12.00

NO. 51

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
2	5	¾		$1.75
2¼	6	¾	B	1.75
2½	7	¾	B	1.75*
3	8	¾		1.80*
3¼	9	1	B	1.85*
3½	10	1 3/16		1.90*
4	11	1 7/16	B	1.95*
4½	12	1 11/16	B	2.00*
5	14	1 15/16		2.10*
5½	15	1 15/16	B	2.15*
6	16	1 15/16	B	2.20*
6½	17	1 15/16	B	2.25*
6¾	18	1 15/16	B	2.35*
7½	20	1 15/16	B	2.50*
8¼	22	1 15/16	B	2.65*
9¼	25	1 15/16		2.90
9¾	27	1 15/16		3.10
10½	29	1 15/16	B	3.25
11	30	1 15/16	B	3.35
11½	31	1 15/16		3.45
11¾	32	1 15/16	B	3.55*
13	35	1 15/16	B	3.80
14	38	1 15/16	B	4.00
14½	40	1 15/16	B	4.30
15¾	43	1 15/16	B	4.70
17¾	48	1 15/16	B	5.25
18½	50	1 15/16	B	5.55
20	54	1 15/16		6.05
22	60	1 15/16	B	6.75

NO. 52

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
3	6	1	B	$1.95*
3½	7	1 3/16		1.95*
4	8	1 7/16		2.00*
4½	9	1 11/16	B	2.10*
5	10	1 15/16	B	2.15*
5½	11	1 15/16		2.25*
6	12	1 15/16		2.30*
6¼	13	1 15/16		2.40*
6¾	14	1 15/16	B	2.50*
7½	15	1 15/16		2.60*
7¾	16	1 15/16		2.70*
8¼	17	1 15/16		2.80*
8¾	18	1 15/16		2.90*
9	19	1 15/16		3.05*
9¾	20	1 15/16	B	3.15
10¼	21	1 15/16		3.30
10¾	22	1 15/16	B	3.40
11	23	1 15/16	B	3.55
12¼	25	1 15/16		3.85
12½	26	1 15/16		4.00
13	27	1 15/16		4.15
13½	28	1 15/16	A	4.30
14	29	1 15/16		4.45
14½	30	1 15/16		4.60
15¼	31	1 15/16		4.80
15¾	32	1 15/16	B	4.95
16	33	1 15/16	B	5.10
16½	34	1 15/16		5.30
18	37	1 15/16		5.75
19	39	1 15/16		6.15
19½	40	1 15/16	B	6.30
20	41	1 15/16		6.45
20½	42	1 15/16		6.60
22¼	46	1 15/16		7.30
23¾	49	1 15/16		7.80

*Plate center wheels; all others have arms.

Note.—Extra charges for large bores, large hubs, split hubs, facing both ends of hub and set screws over keyway, listed on previous page.

CAST-IRON SPROCKET WHEELS FOR DETACHABLE LINK CHAINS

(Continued)

Diameter, Inches	No. of Teeth	Largest Bore, Inches, at Reg. Price	Kind	Each
NO. 52—Continued				
24 1/2	50	1 15/16	B	$8.00
25 1/4	52	1 15/16	B	8.30
25 3/4	53	1 15/16	A	8.45
27 3/4	57	1 15/16		9.00
30	62	1 15/16		10.00
30 1/2	63	1 15/16	B	10.15
31	64	1 15/16		10.35
36	74	1 15/16		12.00
39 3/4	82	1 15/16	B	14.00
NOS. 57, 67, 77				
4	5	1 3/16	B	$2.30*
4 1/2	6	1 7/16		2.30*
5 3/4	7	1 11/16		2.40*
6 1/4	8	1 15/16		2.55*
7	9	2 3/16		2.70*
7 1/2	10	2 7/16		2.90*
8 1/2	11	2 7/16		3.10*
8 3/4	12	2 7/16		3.30*
10	13	2 7/16		3.50*
10 1/2	14	2 7/16		3.75*
11	15	2 7/16		4.00
12	16	2 7/16		4.25
12 1/2	17	2 7/16		4.50
13 1/4	18	2 7/16		4.75
14 1/4	19	2 7/16		5.00
14 3/4	20	2 7/16		5.25
15 3/4	21	2 7/16		5.50
16	22	2 7/16		5.75
17	23	2 7/16	B	6.00
17 3/4	24	2 7/16		6.25
19	25	2 7/16		6.50
19 3/4	27	2 7/16		7.10
20 1/2	28	2 7/16		7.35
21 1/4	29	2 7/16		7.60
22 1/4	30	2 7/16		7.90
23	31	2 7/16	A	8.20
23 1/2	32	2 7/16		8.50
24 1/4	33	2 7/16		8.80
25	34	2 7/16	B	9.10
26 1/2	36	2 7/16		9.70
28 1/4	38	2 7/16		10.30
28 3/4	39	2 7/16	B	10.60
29 1/2	40	2 7/16		10.90
30 1/4	41	2 7/16		11.20
32	43	2 7/16		11.80
32 3/4	44	2 7/16	B	12.10
33 3/4	46	2 7/16	B	12.75
36	49	2 7/16		13.75
38 1/4	52	2 7/16	B	14.80
39 1/4	53	2 7/16	B	15.15
40	54	2 7/16		15.50
44	60	2 7/16	B	17.60
44 3/4	61	2 7/16	B	18.10
47 3/4	65	2 7/16		20.00
NO. 62				
3 1/4	6	1	B	$2.15*
3 3/4	7	1		2.15*
4 1/4	8	1 3/16		2.20*
4 3/4	9	1 7/16		2.25*
5 1/2	10	1 11/16		2.35*
6	11	1 11/16		2.45*
6 1/2	12	1 15/16		2.55*
7	13	1 15/16		2.65*
7 1/2	14	2 3/16		2.75*
8	15	2 7/16		2.90*
8 1/2	16	2 7/16	B	3.05*
9	17	2 7/16		3.20*
9 1/2	18	2 7/16	B	3.35*
10 1/4	19	2 7/16		3.50*
10 3/4	20	2 7/16		3.65
11 1/4	21	2 7/16	B	3.80
11 3/4	22	2 7/16		3.95*
NO. 62—Continued				
12	23	2 7/16		$4.10
12 3/4	24	2 7/16		4.25
13 1/2	25	2 7/16		4.40
13 3/4	26	2 7/16	B	4.55
14 1/4	27	2 7/16		4.70
14 1/2	28	2 7/16		4.90
16	30	2 7/16		5.30
17	32	2 7/16	B	5.70
18	34	2 7/16		6.10
20 1/2	38	2 7/16		6.90
20 3/4	39	2 7/16	B	7.10
21 3/4	41	2 7/16	B	7.50
22 1/4	42	2 7/16	B	7.70
22 3/4	43	2 7/16		7.90
23 3/4	45	2 7/16		8.35
25 3/4	49	2 7/16		9.25
27	51	2 7/16	B	9.75
30	57	2 7/16	B	11.60
30 3/4	58	2 7/16		11.80
35 3/4	68	2 7/16	B	15.20
48	91	2 7/16		23.00
NO. 66				
4	6	1 7/16		$2.20*
5 1/4	8	1 7/16	B	2.30*
6	9	1 7/16	B	2.40*
6 1/2	10	1 15/16		2.55
7 1/4	11	1 15/16	B	2.70*
7 3/4	12	2 3/16	B	2.85*
8 1/2	13	2 7/16	B	3.00*
9	14	2 7/16	B	3.20*
9 3/4	15	2 7/16	B	3.40*
10 1/2	16	2 7/16	B	3.50*
11	17	2 7/16		3.80
11 3/4	18	2 7/16		4.00*
12 1/4	19	2 7/16		4.20
13	20	2 7/16	B	4.40
13 1/2	21	2 7/16		4.80
14 1/4	22	2 7/16		5.00
15 1/2	24	2 7/16		5.40
16 1/4	25	2 7/16	B	5.60
23 1/4	36	2 7/16	B	8.25
29 3/4	46	2 7/16	B	10.00
NOS. 75, 78, 88				
4 1/2	5	1		$2.75*
5 1/4	6	1 3/16		2.90*
6	7	1 11/16		3.10*
6 3/4	8	1 15/16		3.30*
7 3/4	9	2 3/16		3.50*
8 1/4	10	2 7/16		3.75*
9 1/4	11	2 11/16		4.00*
10 1/4	12	2 15/16		4.30*
11	13	2 15/16		4.60*
12	14	2 15/16		4.90
12 1/2	15	2 15/16		5.20
13 1/2	16	2 15/16		5.55
14 1/2	17	2 15/16		5.90
15 1/4	18	2 15/16		6.25
16 1/2	19	2 15/16		6.60
16 3/4	20	2 15/16		6.95
17 1/2	21	2 15/16		7.30
18 1/2	22	2 15/16		7.65
19 1/4	23	2 15/16		8.00
20 1/2	24	2 15/16		8.35
21	25	2 15/16		8.70
22	26	2 15/16	B	9.05
22 1/2	27	2 15/16		9.40
23	28	2 15/16		9.75
24	29	2 15/16		10.10
25	30	2 15/16		10.45
26	32	2 15/16		11.15
27	33	2 15/16		11.55
28	34	2 15/16	B	11.95
29	35	2 15/16		12.35
30	36	2 15/16		12.75
NOS. 75, 78, 88—Continued				
31	37	2 15/16		$13.20
32	38	2 15/16		13.65
32 3/4	39	2 15/16	B	14.10
33 3/4	40	2 15/16		14.60
36	43	2 15/16		16.20
37	44	2 15/16		16.75
37 3/4	45	2 15/16	A	17.30
38 1/2	46	2 15/16		17.85
41 1/4	49	2 15/16		19.50
42	50	2 15/16	B	20.00
48	57	2 15/16		24.25
50 1/4	60	2 15/16	B	26.00
54 1/2	65	2 15/16	B	30.00
60 3/4	72	2 15/16	B	35.00
64 1/4	77	2 15/16		40.00
67	80	2 15/16		42.05
NOS. 83, 93				
6 3/4	5	1 11/16	B	$4.10*
8	6	1 15/16		4.60*
9 1/4	7	2 7/16	B	5.10*
10 1/2	8	2 7/16		5.40*
12	9	2 15/16		5.70*
14 1/4	11	2 15/16	B	6.70
15 1/2	12	2 15/16		7.20
18	14	2 15/16		8.20
20 1/2	16	2 15/16		9.30
24 1/2	19	2 15/16		11.10
25 1/2	20	2 15/16		11.70
30 1/2	24	2 15/16		14.90
35 3/4	28	2 15/16		18.00
48 1/2	38	2 15/16		28.00
NOS. 85, 95				
7	5	1 11/16		$4.30*
8	6	1 15/16	B	4.70*
10 1/4	8	2 7/16		5.70*
11 3/4	9	2 15/16	B	6.30*
13	10	2 15/16		6.80*
14 1/4	11	2 15/16		7.30
15 1/2	12	2 15/16		7.80
16 3/4	13	2 15/16		8.40
18 1/4	14	2 15/16		9.00
19 1/4	15	2 15/16	B	9.70
20 1/2	16	2 15/16		10.40
22 3/4	18	2 15/16		11.70
24 1/2	19	2 15/16		12.40
26 3/4	21	2 15/16		13.75
28	22	2 15/16	B	14.50
29 1/4	23	2 15/16		15.50
33	26	2 15/16		18.70
34 1/2	27	2 15/16		19.70
40 3/4	32	2 15/16	B	26.30
48 1/2	38	2 15/16	B	34.00
59	47	2 15/16	B	45.50
NO. 103				
6	6	1 15/16		$3.60*
7	7	1 15/16		4.00*
8	8	2 3/16		4.40*
9	9	2 7/16		4.80*
10	10	2 15/16		5.25*
11	11	3 7/16		5.65*
12	12	3 7/16		6.05*
13	13	3 7/16		6.45*
14	14	3 7/16		6.85*
15	15	3 7/16		7.25
16	16	3 7/16		7.65
17	17	3 7/16		8.05
17 3/4	18	3 7/16		8.45
18 3/4	19	3 7/16		8.90
19 3/4	20	3 7/16		9.40
NO. 103—Continued				
20 3/4	21	3 7/16		$9.90
21 3/4	22	3 7/16		10.35
22 3/4	23	3 7/16		10.80
23 1/2	24	3 7/16		11.20
24 3/4	25	3 7/16		11.70
25 3/4	26	3 7/16		12.25
26 3/4	27	3 7/16		12.75
27 3/4	28	3 7/16		13.30
28 3/4	29	3 7/16		13.85
29 1/2	30	3 7/16		14.40
30 1/2	31	3 7/16		15.20
31 1/2	32	3 7/16		16.00
32 1/2	33	3 7/16		16.80
33 1/2	34	3 7/16		17.60
34 1/4	35	3 7/16		18.40
35 1/2	36	3 7/16		19.25
26 1/2	37	3 7/16		20.20
37 1/2	38	3 7/16		21.20
39 1/4	40	3 7/16		23.10
40 1/2	41	3 7/16		24.00
41 1/2	42	3 7/16	B	24.80
43 1/2	44	3 7/16	B	26.50
44 1/2	45	3 7/16		27.35
45 1/4	46	3 7/16	B	28.20
48	49	3 7/16		30.75
54	55	3 7/16		35.75
57	58	3 7/16	B	38.30
66	67	3 7/16		46.50
71 3/4	73	3 7/16	B	55.00
NO. 104 1/2				
10 1/2	7	3 7/16	B	$6.00*
13 1/4	9	3 7/16	A	7.25*
16	11	3 7/16		8.50*
20 1/4	14	3 7/16	B	11.80
21 3/4	15	3 7/16	B	13.00
23 1/4	16	3 7/16	B	14.50
24 3/4	17	3 7/16		16.00
30 1/2	21	3 7/16	B	20.00
47 3/4	33	3 7/16	B	37.00
NOS. 108, 110				
9 3/4	6	2 15/16		$5.50*
12 1/2	8	3 7/16		6.80*
14	9	3 7/16		7.50*
15 1/2	10	3 7/16		8.30
17 1/4	11	3 7/16		9.10
18 1/2	12	3 7/16		9.90
20 1/4	13	3 7/16		10.90
21 1/2	14	3 7/16	B	12.00
25	16	3 7/16		14.00
27 1/4	18	3 7/16	B	16.25
30 1/2	20	3 7/16		18.50
36 1/4	24	3 7/16		24.00
42 1/4	28	3 7/16	B	29.30
44 1/4	29	3 7/16		30.65
47 1/2	31	3 7/16		34.50
NO. 114				
5 1/2	5	1 11/16	A	$4.10*
6 3/4	6	2		4.40*
7 1/2	7	2 3/16	B	4.70*
8 1/2	8	2 7/16		5.00*
9 3/4	9	2 15/16		5.40*
10 3/4	10	2 15/16		5.80*
11 3/4	11	2 15/16		6.20*
12 3/4	12	3 7/16		6.70*
13 3/4	13	3 7/16		7.20*
15	14	3 7/16		7.70
16	15	3 7/16		8.20
17	16	3 7/16		8.70
18	17	3 7/16	B	9.20
19	18	3 7/16		9.70

*Plate center wheels; all others have arms.

Note.—Extra charges for large bores, large hubs, split hubs, facing both ends of hub and set screws over keyway listed on previous page.

RIVETED DRIVE CHAINS

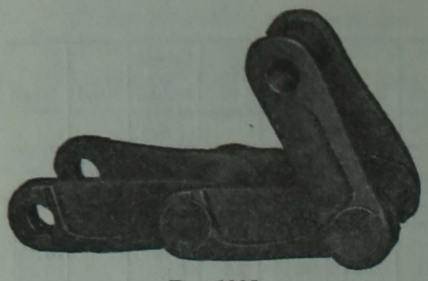


Fig. 1835
NO. T535

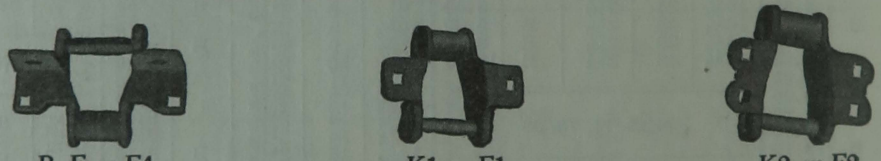
Well adapted to elevator service of moderate speeds under semi-gritty conditions and is popular as a drive chain. Will fit wheels for detachable chains as noted below:

Chain NOS.	Approx. Links, 10 Feet	Approx. Weight per Foot	‡Working Strength in Lbs. at 150 Ft. per Min.	**Max. Speed Feet per Min.	Works over Sprockets NOS.	Dimensions in Inches				Plain Chain per Ft.
						Diameter of Boss	Over All, Width	Over All, Depth	Diameter Pin	
*60R	52	2.11	1100	600	57, 67, 77	11/16	2 3/8	3/4	5/16	$0.38
60H	52	2.25	1300	600	57, 67, 77	11/16	2 3/8	15/16	3/8	.45
*73R	51	4.08	2000	500		31/32	2 7/8	1 1/16	7/16	.53
*74R†	46	2.79	1500	600	75, 78, 88	29/32	2 9/16	15/16	3/8	.41
75R	46	2.09	1200	600	75, 78, 88	23/32	2 3/4	3/4	5/16	.38
*78R†	46	4.18	2300	500	75, 78, 88	1	3	1 1/8	1/2	.56
82R†	39	5.62	3000	500	103	1 3/16	3 5/8	1 1/4	9/16	.75
87R	30	6.96	3800	400	124	1 11/32	3 15/16	1 3/8	5/8	.98
95R	30	5.08	2700	400	95	1 1/8	4 1/32	1 3/16	1/2	.68
108R	21.2	5.81	3500	300	108		4 3/4	1 5/16	9/16	.75
*124R†	30	8.44	5000	300		1 7/16	4 5/8	1 9/16	3/4	1.13

Bold face type indicates stock sizes.
*Popular sizes for transmitting power, used also for conveyors.
†Popular sizes for elevators and conveyors, used also for drives.
‡Working strengths in table are increased or decreased for speeds other than 150 ft. per min. Use but half of values thus obtained for service in gritty materials.
**Economical speeds are half of maximum speeds.

ATTACHMENTS FOR RIVETED DRIVE CHAINS

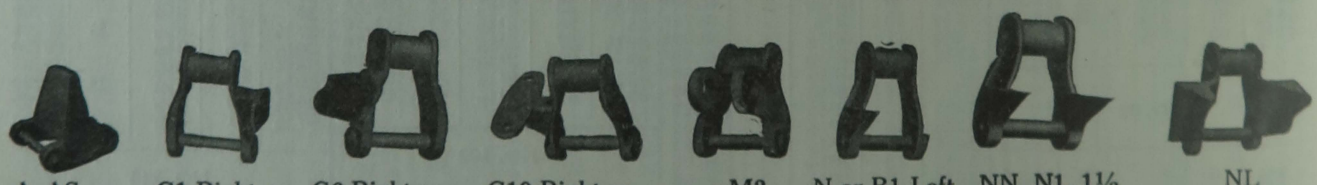
STANDARD STOCK ATTACHMENTS



B, F or F4 | K1 or F1 | K2 or F2

Fig. 1836

STANDARD ATTACHMENTS—MADE TO ORDER



A, AS or H2 | G1 Right or Left | G6 Right or Left | G19 Right or Left | M3 | N or R1 Left or Right | NN, N1, 1½ or R2 | NL

Fig. 1837

Chain NOS.	A or H-2	AS or H-1	B and F or F-4	K-1 or F1	K-2 or F-2	G-1	G-6	G-19	M-3	NL	N or R-1	NN or R-2	Coupling Pins per 100	Rivets per 100
60R	$0.60	.....	$0.68	$0.53	.....	.....	.....	.....	.....	.....	$0.53	$0.60	$2.45	$1.40
73R	.75	.....	.98	.68	.....	.....	.....	.....	.....	.....	.68	.75	3.75	2.55
74R	.68	$0.68	.83	.53	.....	.....	.....	.....	$0.68	.....	.53	.60	3.30	2.10
75R	.60	.....	.60	.53	.....	.....	.....	.....	.....	.....	.45	.50	2.55	1.50
78R	.90	.90	.98	.75	.....	$0.75	$0.83	$0.90	.90	.....	.68	.75	4.10	2.60
82R	1.05	.....	1.13	.98	$1.05	.....	1.05	.....	.....	.....	.90	.....	6.15	4.50
87R	.....	.....	1.35	.....	1.28	.....	.....	.....	.....	$1.80	.....	.....	6.35	4.50
95R	.....	.....	1.13	.....	.90	.....	.....	1.35	.....	.....	.....	.....	4.85	3.35
108R	.....	.....	1.20	.....	.....	.....	.....	.....	.....	.....	.....	.....	6.60	5.00
124R	.....	.....	1.50	.....	1.50	.....	.....	.....	1.50	2.25	.....	.....	13.00	10.00

SQUARE SHANK PIN CHAINS

MALLEABLE IRON AND STEEL

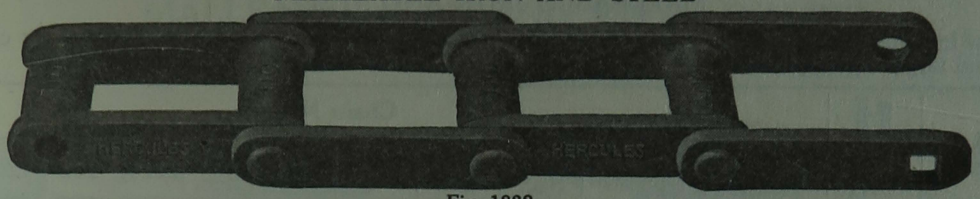


Fig. 1838

NO. T 536

An excellent hard service chain. Fitted especially for single and double strand elevators in gritty dry or damp places. Used in cement plants, chemical works, mines, etc., and for general conveying and elevating work. Made up with riveted pins unless ordered to be made up with pins with cotters or with pins with nuts and cotters.

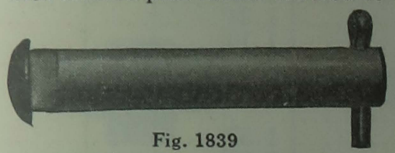


Fig. 1839

Coupling Pin NO. T-536A

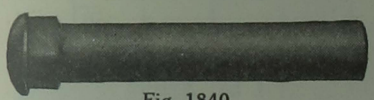


Fig. 1840

Rivet Pin NO. T-536B

Method of construction renders chain virtually dust proof. Has malleable block links and steel side bars and links. The square shank pins confine the wear to inside of solid links. Very little wear on outside links. The rigid holding of pins in side bars is assured. Can be furnished also with manganese block links and pins.

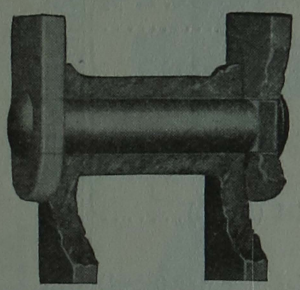


Fig. 1841

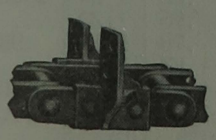
Chain NOS.	Pitch, Inches	Approx. Weight Per Foot, Lbs.	Working Strength 150 Feet Per Min. †	Max. Speed, Feet Per Min. ††	For Use on Sprockets NOS.	Plain Chain per Foot	Dimensions in Inches				
							Side Bar		Diameter Pins	Overall Width	Dia., Boss Around Pin
							Width	Thickness			
102†	3.96	9.2	2500	450	85–95	$0.70	1½	⅜	½	4¼	1
102-B	3.96	9.2	3900	450	85–95	.76	1½	⅜	⅝	4¼	1
*102½†	4.03	12.0	5600	400	.....	1.00	1¾	⅜	¾	4⅝	1⅜
102½Sp	4.04	12.0	6600	300	.....	1.50	2	⅜	⅞	5	1⁹⁄₁₆
102½ASp	4.04	12.0	7500	300	.....	2.00	2	⅜	1***	5	1⁹⁄₁₆
110†	6.00	9.0	3900	350	.....	.70	1½	⅜	⅝	4⅜	1¼
111†	4.78	9.6	5600	400	108	1.00	1¾	⅜	¾	5	1⅜
**111Sp†	4.78—7.22	7.8	5600	350	.....	.85	1¾	⅜	¾	5	1⅜
111½	4.838	...	5600	400	.....	1.20	1¾	⅜	¾	5	1¾
*131	3.07	6.4	3750	550	103	.80	1⅜	⅜	⅝	3½	1¼
132†	6.125	14.2	10000	300	122	1.40	2	½	1	6⅜	1¾
142†	4.00	2.8	1650	550	.....	.45	1	¼	⁷⁄₁₆	2½	1⁹⁄₁₆
*188	2.61	4.2	2450	600	75, 78, 88	.55	1⅛	¼	½	2⅞	⅞

Bold face type indicates stock sizes.
*Sizes recommended for transmitting power—used also for conveyors.
†Sizes recommended for elevators and conveyors—used also for transmitting power.
‡Working strengths in table are increased or decreased for speeds other than 150 feet per minute.
††Economical speeds are half of maximum speeds.
**Alternate long and short pitches, with long pitch in steel side bars.
***Milled pin in steel side bars.

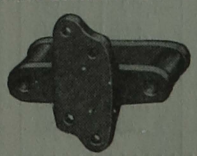
ATTACHMENTS FOR SQUARE SHANK PIN CHAINS

MALLEABLE IRON AND STEEL
STANDARD STOCK ATTACHMENTS

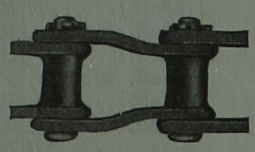
F-2



F2½



G-6 or G-1 Standard Buckets
G-6 with 4 holes. G-1 with 2 holes

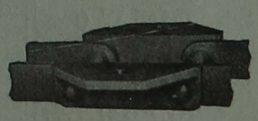


Coupling link (Malleable)

K-1

K-1

K-2



K-2

Fig. 1842

SQUARE SHANK PIN CHAINS AND ATTACHMENTS

MALLEABLE IRON AND STEEL

Prices below include chains with either riveted or cotter fastened coupling pins. Special prices for coupling pins 3/8 inch diameter and larger having lock nuts. **Prices Per Foot Assembled**

Attachment NOS.	Spacing per Links	Chain NOS. 102	102B	102½	102½ Spc.	102A Spc.	110	111	111 Spc.	111½	131	132	142	188
Plain Chain		$0.70	$0.76	$1.00	$1.50	$2.00	$0.70	$1.00	$0.85	$1.20	$0.80	$1.40	$0.45	$0.55
DD (Malleable)	2d													
	4th													
	6th													
E-½ & Spec. E-½ (Steel)	2d	1.31	1.37								1.69			
	4th	1.01	1.07								1.24			
	6th	.91	.97								1.10			
E (Malleable)	2d												.57	
	4th												.51	
	6th												.49	
E Side Bar (Steel)	2d	1.34	1.40								1.57			
	4th	1.02	1.08								1.20			
	6th	.92	.98								1.06			
E-1 (Mall.)	2d												.57	
	4th												.51	
	6th												.49	
E-1 Side Bar (Steel)	2d	1.34	1.40	1.67	2.17	2.67	1.35	1.70			1.57	2.10		
	4th	1.02	1.08	1.34	1.84	2.34	1.03	1.35			1.20	1.75		
	6th	.92	.98	1.23	1.73	2.23	.92	1.24			1.06	1.63		
Spec. E-1 (Mall.)	2d						.78							
	4th						.74							
	6th						.73							
E1½ (Steel)	2d	1.31	1.37				1.10	1.51						
	4th	1.01	1.07				.90	1.25						
	6th	.91	.97				.84	1.17						
Spec. E-1½ (Steel)	2d	1.31	1.37	1.60	2.10		1.10	1.51			1.69			
	4th	1.01	1.07	1.30	1.80		.90	1.25			1.24			
	6th	.91	.97	1.20	1.70		.84	1.17			1.10			
F-2 (Mall.)	2d			1.47				1.25	1.05		1.25		.57	.70
	4th			1.25				1.15	.98		1.10		.51	.63
	6th			1.17				1.10	.95		1.00		.49	.60
F-2½ (Mall.)	2d	1.59	1.65											
	4th	1.15	1.21											
	6th	1.00	1.06											
F-28 (Mall.)	2d										1.49			.69
	4th										1.15			.62
	6th										1.03			.60
G-1 (Mall.)	2d						.95	1.25	1.05		1.10			
	4th						.83	1.15	.98		.95			
	6th						.78	1.10	.95		.90			
G-6 (Mall.)	2d						.95	1.25	1.05		1.10			.75
	4th						.83	1.15	.98		.95			.65
	6th						.78	1.10	.95		.90			.63
G-19 (Mall.)	2d										1.00			.69
	4th										.90			.62
	6th										.87			.60
K-1 (Mall.)	2d	.85	.91								.97			.75
K-1 (Mall. & St.)	3d	.90	.96								1.05			.80
K-1 (Mall.)	4th	.78	.84								.89			.65
K-1 (Mall. & St.)	5th	.82	.88								.95			.70
K-1 (Mall.)	6th	.75	.81								.86			.62
K-1 (Mall. & St.)	All	1.30	1.36								1.50			1.25
K-2 (Mall.)	2d	.85	.91	1.20	1.85	2.53	.82	1.20	1.00	1.40	.97	1.75	.60	.75
K-2 (Mall. & St.)	3d	.90	.96	1.20	2.35	2.34	.95	1.20		1.40	1.05	1.75	.60	.80
K-2 (Mall.)	4th	.78	.84	1.10	1.68	2.27	.78	1.10	.93	1.30	.89	1.65	.53	.65
K-2 (Mall. & St.)	5th	.82	.88	1.10	2.01	2.20	.83	1.12		1.32	.95	1.65	.55	.70
K-2 (Mall.)	6th	.75	.81	1.08	1.62	2.18	.75	1.08	.90	1.28	.86	1.55	.50	.62
K-2 (Mall. & St.)	All	1.30	1.36	1.50	4.10		1.10	1.60		1.80	1.50	2.35	.90	1.25
M-3	2d										1.94	1.96		.88
	4th										1.37	1.68		.72
	6th										1.18	1.59		.66
S-6 (Mall.) (formerly F-17)	2d										1.29	1.76		
	4th										1.05	1.59		
	6th										.97	1.53		
S-7 (Mall.) (formerly F-18)	2d										1.49			
	4th										1.15			
	6th										1.03			

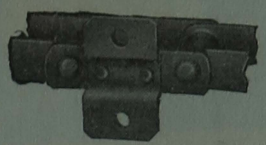
Bold face type indicates stock sizes. Note.—For diameter of pins see tabulated list on previous page.

ATTACHMENTS FOR SQUARE SHANK PIN COMBINATION MALLEABLE IRON AND STEEL CHAINS

STANDARD ATTACHMENTS—MADE ON ORDER

No. DD

No. E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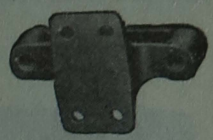
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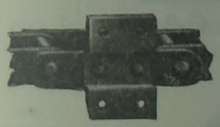
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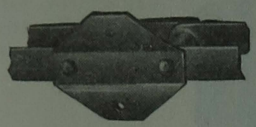
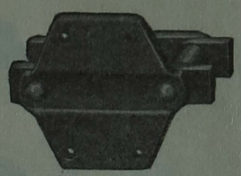

No. E Side Bar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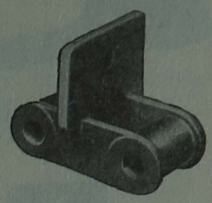
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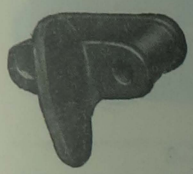
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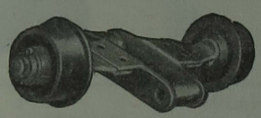
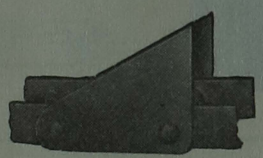

No. K-2 Axle Plates‡

No. M-3


No. S

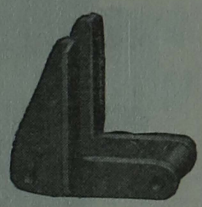

No. S-7 or S-6

Fig. 1843

Price each for Detached Parts

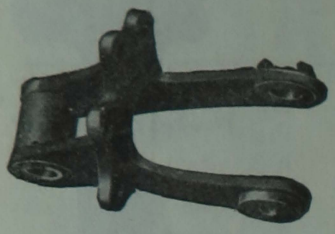
Chain NOS.	102	102B	102½	102½ Sp.	102½ A Sp.	110	111	111 Sp.	111½	131	132	142	188
No. of links in 100-ft. Chain	304	304	296	298	298	200	251	200	250	391	196	300	462
Name of Part													
Block Link, M. I.	$0.25	$0.25	$0.37	$0.57	$0.60	$0.40	$0.43	$0.43	$0.60	$0.20	$0.78	$0.14	$0.12
Plain Side Bar, Steel	.09	.09	.10	.12	.12	.11	.11	.16	.11	.06	.20	.06	.04
Pin Rivet, Steel	.03	.04	.07	.08	.27	.05	.08	.08	.08	.05	.14	.03	.03
Pin Cottered, Steel	.04	.05	.08	.09		.06	.09	.09	.09	.06	.16	.04	.04
‡Coupling Link, M. I.	.30	.36	.43			.45	.53			.30	.95	.18	.15
DD att. (on block) M. I.													
E att. (on block) M. I.												.22	
†E-½ att. steel riveted to side bar	.42	.42								.42			
E att. side bar (steel)	.55									.50			
†Spec. E-½ att. steel riveted on	.42	.42								.42			
†El att. (on block link) M. I.												.22	
†El-½ att. steel riveted to side bar	.42	.42				.42	.42						
El side bar (steel)	.55	.55	.60	.60	.60	.80	.70			.50	1.00		
Spec. El att. (on block link)						.48							
†Spec. El-½ att. riveted on	.42	.42	.42	.42		.42	.42			.50			
F-28 (block link) M. I.										.55			.18
F-17 see S-6 (now called)													
F-18 see S-7 (now called)													
F-2 (block link) M. I.			.66				.62	.62		.45		.20	.18
†F-2½ M. I. riveted on pair	.58	.58											
G-1 (block link) M. I.						.62	.64	.64		.35			
G-6 (block link) M. I.						.62	.64	.64		.35		.22	.20
G-19 (block link) M. I.										.35			.18
K-1 steel side bar	.24	.24					.26	.37		.20			.15
K-1 (block link) M. I.	.34	.34					.58	.58		.28			.17
K-2 steel side bar	.24	.24	.25		.28	.25	.26	.37	.26	.20	.55	.17	.15
K-2 (block link) M. I.	.34	.34	.50	.80	.95	.53	.58	.58	.75	.28	1.10	.25	.17
K-2 drop forged side bar				.90	.90								
M-3 steel side bar										.40			
M-3 side bar M. I.													.12
M-3 (block link) M. I.											1.35		
S-6 (block link) M. I.										.45	1.15		
S-7 (block link) M. I.										.55			

‡Coupling link complete with two cottered pins as illustrated.
†Price of plain side bars to be added to make complete attachment.

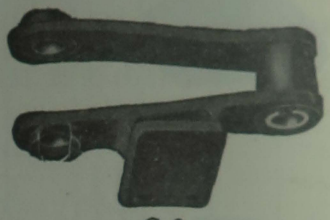
ATTACHMENTS FOR STEEL BUSHED COMBINATION CHAINS

STANDARD STOCK ATTACHMENTS

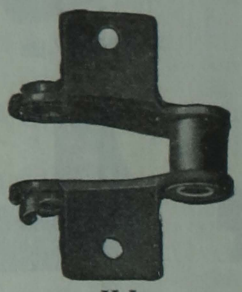
Attachments Nos. F-2, G-6, K-1 and K-2 for Nos. 823 and 835 and for Nos. 825, 830, 843, 844 and 847 chains are standard stock attachments.



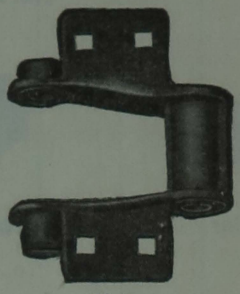
F-2



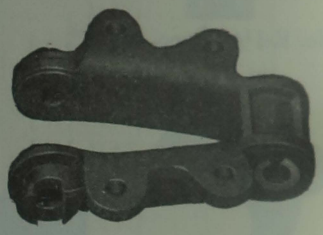
G-6



K-I



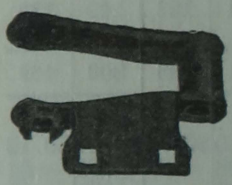
K-2
On Nos. 823 and 835



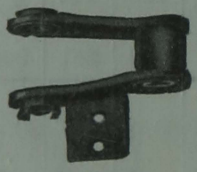
K-2
On Nos. 825, 830,843, 844, 847

Fig. 1844

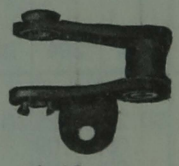
STANDARD ATTACHMENTS—MADE ON ORDER



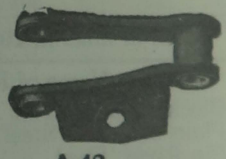
A-4



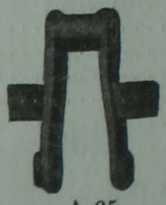
A-38



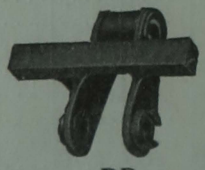
A-42
On Nos. 823, 825*



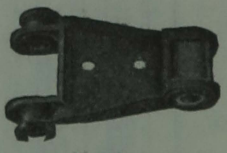
A-42



A-65

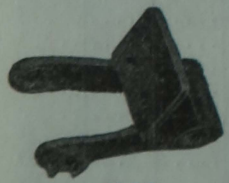


DD

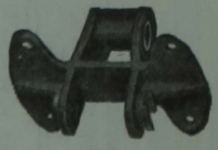


E-24

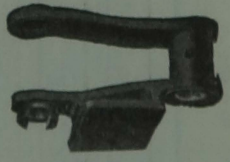
F-4



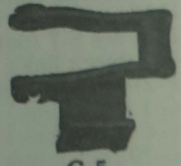
F-16



FF

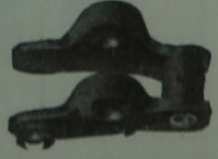


G-1



G-5

K-53



M-3

Fig. 1845

*In ordering Spare A-42 attachments on Nos. 823, 825 chains order also A-42 coupler to fit attachments into chain.

STEEL BUSHED COMBINATION CHAINS

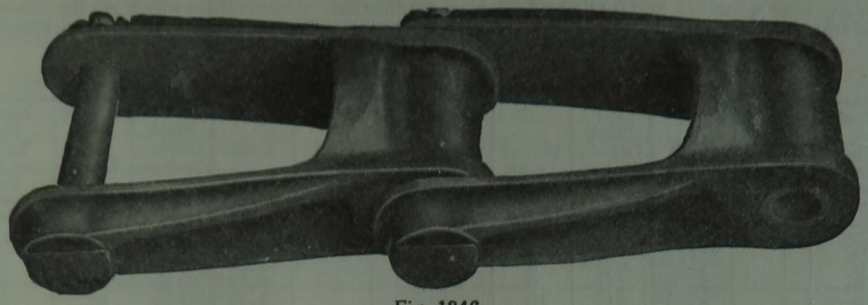


Fig. 1846
No. T-537

Specially adapted for elevator service in gritty materials, and is so designed that its hardened steel bushing and pins can be readily renewed, thus virtually making a new chain. Practically all wear of chain over sprocket is taken by outside of the renewable bushings. For proper direction to run chain, see note under sprockets.

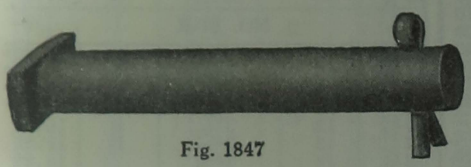


Fig. 1847

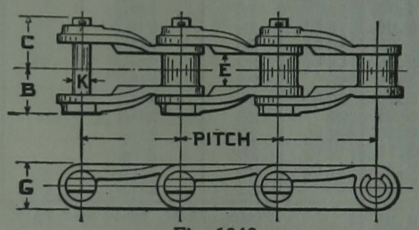


Fig. 1848

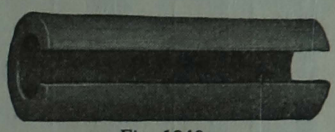


Fig. 1849

General Dimensions

Chain Nos.	Approx. Pitch, Inches	Approx. Weight, per Ft.	Working Strength at 150 Ft. per Min. Lbs.‡	Max. Speed Ft. per Min.¶	Dimensions in Inches				
					B	C	E	G	K
823	4	4.75	3000	500	$1\frac{13}{16}$	$1\frac{13}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$	$\frac{1}{2}$
825	4	9.00	5075	450	2	$2\frac{15}{16}$	2	$1\frac{3}{8}$	$\frac{3}{4}$
830	6	....	5075	450	$1\frac{7}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{7}{8}$	$\frac{3}{4}$
835	4	9.00	4700	450	$2\frac{7}{8}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{7}{8}$	$\frac{5}{8}$
843	6	10.8	6200	400	$2\frac{3}{4}$	$3\frac{3}{8}$	$1\frac{7}{8}$	$2\frac{1}{4}$	$\frac{3}{4}$
844	6	10.8	7750	400	$2\frac{11}{16}$	$3\frac{3}{8}$	$2\frac{1}{2}$	$2\frac{1}{8}$	$\frac{3}{4}$
847	6	19.5	12750	350	$3\frac{5}{8}$	4	3	$2\frac{11}{16}$	1

¶For economy, speeds should not exceed half of maximum speeds.
‡Working strengths in table should be increased or decreased for speeds other than 150 feet per minute.

List per Foot of Plain Chains and Attachments.

Sizes and Attachments	Chain Nos.						
	823	825	830	835	843	844	847
Plain Chain	$1.00	$1.60	$1.30	$1.80	$2.20	$1.10	$3.25
A4	1.15	.....	.....	.....	.....	.....	.....
A38	.....	2.05	.....	.....	.....	.....	.....
A42P	1.10	1.75	.....	.....	.....	.....	.....
A42	1.40	2.15	1.65	.....	.....	2.00	.....
A65	1.30	.....	.....	.....	.....	.....	.....
DD	.....	2.85	.....	.....	.....	.....	.....
E20	.....	.....	.....	.....	.....	.....	.....
E24	.....	.....	.....	.....	2.65	.....	.....
F2	1.60	2.25	1.75	.....	.....	2.50	.....
F4	1.75	.....	.....	.....	.....	.....	.....
F16	1.85	.....	.....	.....	.....	.....	.....
FF	.....	2.25	2.20	.....	.....	.....	.....
G1	1.50	2.25	.....	.....	.....	.....	.....
G5	1.95	.....	.....	.....	.....	.....	.....
G6	1.50	2.25	1.80	.....	.....	.....	.....
G17	.....	.....	.....	.....	.....	.....	.....
K1	.....	2.25	.....	.....	.....	.....	.....
K2	1.25	2.30	1.80	2.20	2.55	2.00	4.50
K4	.....	.....	.....	.....	.....	.....	.....
K53	.....	4.20	.....	.....	.....	.....	.....
M3	1.90	.....	.....	.....	.....	.....	.....
M25	.....	.....	2.75	.....	.....	.....	.....
M37	.....	2.50	.....	.....	.....	.....	.....
Pins, each	$0.14	.25	.25	.25	.34	.34	.70
Bushings, each	$0.10	.15	.15	.17	.20	.20	.35
Average ultimate strength in lbs	19,600	44,000	30,000	30,700	44,200	44,200	78,600
Approx. links in 10 feet	30	30	20	30	20	20	20

CAST IRON SPROCKET WHEELS

Prices for chilled rim and steel sprockets, and for flanged idlers on application. Always state which are the driving and which the driven wheels. Unless otherwise stated driven wheels will be furnished. "A" stands for driving and "B" for driven wheels. When not indicated both kinds are made.

FOR RIVETED DRIVE CHAINS

Pitch Diam., Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
NOS. 60-R and 60-H				
5 1/4	7	1 7/16		$2.40*
6	8	1 7/16		2.55*
6 3/4	9	1 15/16		2.70*
7 1/2	10	2 1/16		2.90*
8 1/4	11	2 1/16		3.10*
9	12	2 1/16		3.30*
9 1/2	13	2 1/16		3.50*
10 1/4	14	2 1/16		3.75*
11	15	2 1/16		4.00
11 3/4	16	2 1/16		4.25
12 1/2	17	2 1/16		4.50
13 1/4	18	2 1/16		4.75
14	19	2 1/16		5.00
14 3/4	20	2 1/16		5.25
15 1/2	21	2 1/16		5.50
16 1/4	22	2 1/16		5.75
17	23	2 1/16		6.00
17 3/4	24	2 1/16		6.25
18 1/4	25	2 1/16		6.50
19 1/2	26	2 1/16		6.75
19 3/4	27	2 1/16	B	7.10
20 1/2	28	2 1/16		7.35
22	30	2 1/16		7.90
23	31	2 1/16	B	8.20
24 1/4	33	2 1/16		8.80
25	34	2 1/16	B	9.10
26 1/2	36	2 1/16		9.70
28 3/4	39	2 1/16	B	10.60
29 1/4	40	2 1/16		10.90
32 1/2	44	2 1/16	B	12.10
33 3/4	46	2 1/16		12.75
35 1/4	48	5 7/16		13.40
36	49	2 1/16		13.75
38 1/2	52	2 1/16	B	14.80
39 3/4	54	2 1/16		15.50
43 3/4	60	2 1/16		17.60
NO. 73-R				
5 1/4	7	1 11/16		$3.40*
6 1/4	8	1 15/16		3.60*
7	9	2 3/16		3.85*
7 1/2	10	2 1/16		4.15*
8 1/2	11	2 1/16	B	4.40*
8 3/4	12	2 1/16	A	4.70*
11 1/2	15	2 1/16		5.90
13 3/4	18	2 1/16	B	7.10
17 1/2	23	2 1/16	B	8.85
18 1/4	24	2 1/16	B	9.20
20	28	2 1/16	B	10.65
24	32	2 1/16	B	12.10
30 1/4	41	2 1/16	B	16.00
36	48	2 1/16	B	19.00
NOS. 74-R, 75-R and 78-R				
6	7	1 15/16		$3.10*
6 3/4	8	1 15/16		3.30*
7 1/2	9	2 3/16		3.50*
8 1/4	10	2 7/16		3.75*
9 1/4	11	2 11/16		4.00*
10	12	2 15/16		4.30
10 3/4	13	2 15/16		4.60
11 3/4	14	2 15/16		4.90
12 1/4	15	2 15/16		5.20
13 1/4	16	2 15/16		5.55
14 1/4	17	2 15/16		5.90
15	18	2 15/16		6.25
15 3/4	19	2 15/16		6.60
16 3/4	20	2 15/16		6.95
18 1/4	22	2 15/16	B	7.65
20	24	2 15/16		8.35
20 3/4	25	2 15/16		8.70
22	26	2 15/16		9.05
22 1/2	27	2 15/16		9.40
23 1/4	28	2 15/16		9.75
24 1/4	29	2 15/16		10.10
25	30	2 15/16		10.45
NOS. 74-R, 75-R and 78-R				
27 1/2	33	2 15/16		$11.55
28 1/4	34	2 15/16		11.95
29 1/4	35	2 15/16		12.35
30	36	2 15/16		12.75
31	37	2 15/16		13.20
32 1/2	39	2 15/16		14.10
33 1/2	40	2 15/16		14.60
36 3/4	44	2 15/16		16.75
38 1/2	46	2 15/16		17.85
41	49	2 15/16		19.50
42	50	2 15/16	B	20.00
45	54	2 15/16		22.50
48 1/2	58	2 15/16		24.80
50	60	2 15/16		26.00
NO. 82-R				
8	8	2 7/16		$4.40*
9	9	2 15/16	B	4.80*
9 3/4	10	2 15/16	B	5.25*
10 3/4	11	2 15/16	B	5.65
11 3/4	12	2 15/16	B	6.05*
12 3/4	13	3 1/16	B	6.45*
13 3/4	14	3 1/16	B	6.85*
14 3/4	15	3 7/16	B	7.25
15 3/4	16	3 15/16	B	7.65
16 3/4	17	3 15/16	B	8.05
17 1/2	18	3 15/16	B	8.45
18 1/2	19	3 15/16	B	8.90
19 1/2	20	3 15/16	B	9.40
21 1/2	22	3 15/16		10.35
22 1/2	23	3 15/16	B	10.80
NO. 82-R—Continued				
23 1/2	24	3 15/16	B	$11.20
25 1/2	26	3 15/16		12.25
26 1/2	27	3 15/16	B	12.75
27 1/2	28	3 15/16	B	13.30
29 1/4	30	3 15/16	B	14.40
30 1/4	31	3 15/16	B	15.20
32 1/2	33	3 15/16	B	16.00
35 1/4	36	3 15/16	B	19.25
37 1/4	38	3 15/16	B	21.20
39 1/4	40	3 15/16	B	23.10
41	42	3 15/16	B	24.80
43	44	3 15/16	B	26.50
45	46	3 15/16	B	28.20
47 3/4	49	3 15/16	B	30.75
52 1/4	54	3 15/16	B	35.00
58 3/4	60	3 15/16	B	41.00
NO. 87-R				
10 1/2	8	2 15/16	B	$7.90*
11 3/4	9	2 15/16	B	8.40*
13	10	3 3/16	B	9.10*
14 1/2	11	3 7/16	B	9.80*
15 3/4	12	3 7/16	B	10.50
17	13	3 15/16	B	11.35
18 1/4	14	3 15/16		12.20
19 1/2	15	3 15/16		13.00
20 3/4	16	3 15/16		14.00
22	17	3 15/16		15.00
23	18	3 15/16		16.00
24 1/2	19	3 15/16		17.00
26	20	3 15/16		18.00
28 1/2	22	3 15/16		20.25
29 3/4	23	3 15/16		21.35
31	24	3 15/16		22.50
32 1/2	25	3 15/16	B	23.65
36 1/4	28	3 15/16		27.40
39	30	3 15/16		30.00
NO. 95-R				
16 3/4	13	2 7/16	B	$8.40
24	19	2 7/16		12.40
NO. 108-R Sprockets on application				
NO. 124-R				
13 1/4	10	3 7/16	B	$10.80
17 1/4	13	3 15/16	B	14.30
18 1/2	14	3 15/16	B	15.55
22 1/2	17	3 15/16	B	19.80
28 1/2	22	3 15/16		28.00
36 1/2	28	3 15/16	A	36.60
38 1/2	30	3 15/16		39.90

No. 60-R use same as for Nos. 57, 67, 77, detachable.
No. 73-R furnished upon application.
Nos. 74-R, 75-R, 78-R, use same as for Nos. 75, 78, 88, detachable.
No. 82-R use same as for No. 103, detachable.
No. 95-R use same as for No. 95, detachable.

FOR STEEL BUSHED COMBINATION CHAINS

Pitch Diam., Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
NO. 823				
10 1/2	8	2 7/16	B	$5.90*
11 3/4	9	2 7/16	B	6.50
13	10	2 11/16	B	7.00*
14 1/4	11	2 11/16	B	7.50
15 1/2	12	2 15/16	B	8.00
18 1/4	14	2 15/16	B	9.00
19 1/4	15	2 15/16	B	9.70
20 1/2	16	2 15/16	B	10.50
21 3/4	17	2 15/16	B	11.30
24 1/2	19	2 15/16	B	12.90
31	24	2 15/16		17.50
36 3/4	28	2 15/16	B	22.00
48 1/2	38	2 15/16	B	34.00
NO. 825				
10 3/4	8	2 15/16		$7.80
NO. 825—Continued				
12	9	2 15/16	B	$8.40
13	10	2 15/16	B	9.10
14 1/4	11	3 7/16	B	9.80
15 3/4	12	3 7/16		10.50*
18	14	3 15/16		12.20
20 3/4	16	3 15/16	B	14.00
23 1/4	18	3 15/16	B	16.00
29 1/2	23	3 15/16	B	21.30
31	24	3 15/16	B	22.50
35 3/4	28	3 15/16	B	28.20
47 3/4	37	3 15/16	B	50.00
NO. 830				
19 1/2	10	3 15/16	B	$14.00
23 1/4	12	3 15/16	B	16.00
31	16	3 15/16	B	22.50
NO. 835				
29 1/2	23	3 15/16	B	$25.60
NO. 843				
15 3/4	8	3 15/16	B	$13.60
25 1/4	13	3 15/16	B	18.70
NO. 844				
19 3/4	10	3 15/16	B	$16.80
23 1/2	12	3 15/16	B	20.00
25 1/2	13	3 15/16	B	22.00
29 1/4	15	3 15/16	B	26.00
36 3/4	19	3 15/16	B	35.00
NO. 847				
23 1/2	12	4 15/16	B	$31.50

*Use patterns for cast iron driver sprocket wheels. Plate center wheels; all others have arms.
Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs and set screw over keyway.

CAST-IRON SPROCKET WHEELS

FOR SQUARE SHANK PIN COMBINATION MALLEABLE IRON AND STEEL CHAINS

Prices for chilled rims, steel sprockets and flanged idlers quoted upon application.

Always state which are the driving and which the driven wheels. If not stated, driven wheels will be furnished. "A" stands for driving and "B" for driven wheel. When not indicated, both kinds are made.

NOS. 102, 102-B

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
7	5	1 11/16		$4.30*
8	6	1 15/16		4.70*
10 1/4	8	2 7/16		5.70*
11 3/4	9	2 15/16		6.30*
13	10	2 15/16	B	6.80*
14 1/4	11	2 15/16		7.30
15 1/2	12	2 15/16		7.80
16 3/4	13	2 15/16		8.40
18 1/4	14	2 15/16		9.00
19 1/2	15	2 15/16	B	9.70
21	16	2 15/16		10.40
23	18	2 15/16		11.70
24 1/2	19	2 15/16		12.40
26 3/4	21	2 15/16		13.75
28	22	2 15/16	B	14.50
29 1/4	23	2 15/16		15.50
33	26	2 15/16		18.70
34 1/2	27	2 15/16		19.70
40 3/4	32	2 15/16	B	26.30
48 1/2	38	2 15/16	B	34.00
59	47	2 15/16	B	45.50

NO. 102 1/2

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
8	6	1 15/16	B	5.00*
10 1/4	8	2 7/16		6.25*
12	9	2 15/16		6.60*
13	10	2 15/16		7.20
14 1/4	11	2 15/16		7.80*
15 1/2	12	2 15/16	B	8.35*
19 3/4	15	2 15/16		10.10
20 5/8	16	2 15/16		10.75
22	17	2 15/16	A	11.40
23	18	2 15/16	B	12.30
23 3/4	19	2 15/16	B	13.20
28 1/4	22	2 15/16	B	16.30
29 1/2	23	2 15/16		18.00
34	26	2 15/16	B	20.50
40 1/2	31	2 15/16	B	25.00
48 1/4	37	2 15/16	B	35.00
59 3/4	46	2 15/16	B	52.00

NOS. 102 1/2-A and 102 1/2 Special

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
12	9	3 7/16		6.90*
14 1/2	11	3 7/16	B	8.50*
16	12	3 7/16		9.40*
18 1/4	14	3 7/16		11.00
19 1/2	15	3 7/16	B	12.00
21	16	3 7/16	B	13.00
24 3/4	19	3 7/16	B	16.20
27 1/2	21	3 7/16	B	18.50
33 1/4	26	3 7/16	B	24.00

NO. 110

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
12	6	3 7/16	B	12.00*
16	8	3 7/16	B	14.35*
17 3/4	9	3 7/16	B	15.00
19 1/2	10	3 7/16	B	15.50
21 1/2	11	3 7/16	B	16.65
23 1/2	12	3 7/16		17.85
25 1/4	13	3 7/16	B	20.15
31 1/2	16	3 7/16	B	24.75
35	18	3 7/16		30.50
71 1/2	37	3 7/16		86.00

NO. 111

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
18 1/2	12	3 7/16		$10.90
20 1/4	13	3 7/16		12.00
21 1/2	14	3 7/16	B	13.20
23 1/4	15	3 7/16	B	14.30
25	16	3 7/16		15.40
27 1/4	18	3 7/16	B	17.90
30 1/2	20	3 7/16		20.35
33 3/4	22	3 7/16	B	23.40

NO. 111—Special

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
15 3/4	8	3 7/16		15.00
19 1/2	10	3 7/16	B	19.00
23 1/2	12	3 7/16	B	22.00
30 3/4	16	3 7/16	B	28.00

NO. 111 1/2

This chain works over Std. 111 Sprocket having from 13 to 20 teeth or 20- to 30 1/2-inch diameters.

NO. 131

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
6	6	1 15/16		3.60*
7	7	1 15/16		4.00*
8	8	2 3/16		4.40*
9	9	2 7/16		4.80*
10	10	2 15/16		5.25*
11	11	3 7/16		5.65*
12	12	3 7/16		6.05*
13	13	3 7/16		6.45
14	14	3 7/16		6.85
15	15	3 7/16		7.25
16	16	3 7/16		7.65
17	17	3 7/16		8.05
17 3/4	18	3 7/16		8.45
18 3/4	19	3 7/16		8.90
19 3/4	20	3 7/16		9.40
20 3/4	21	3 7/16		9.90
21 3/4	22	3 7/16		10.35
22 3/4	23	3 7/16		10.80
23 1/2	24	3 7/16		11.20
24 3/4	25	3 7/16		11.70
25 3/4	26	3 7/16		12.25
26 3/4	27	3 7/16		12.75
27 3/4	28	3 7/16		13.30
28 3/4	29	3 7/16		13.85
29 1/2	30	3 7/16		14.40
30 1/2	31	3 7/16		15.20
31 1/2	32	3 7/16		16.00
32 1/2	33	3 7/16		16.80
33 1/2	34	3 7/16	B	17.60
35 1/2	36	3 7/16		19.25
36 1/2	37	3 7/16		20.20
37 1/2	38	3 7/16		21.20
39 1/4	40	3 7/16		23.10
40 1/2	41	3 7/16		24.00
41 1/2	42	3 7/16	B	24.80
43 1/2	44	3 7/16	B	26.50
44 1/2	45	3 7/16		27.35
45 1/2	46	3 7/16	B	28.20
48	49	3 7/16		30.75
54	55	3 7/16		35.75
57	58	3 7/16	B	38.30
66	67	3 7/16		46.50
71 3/4	73	3 7/16	B	55.00

NO. 132

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
16	8	3 15/16		9.75*
18	9	3 15/16	B	10.80
20	10	3 15/16		$12.80
22	11	3 15/16	B	14.60
23 3/4	12	3 15/16		16.50
29 1/2	15	3 15/16	B	21.80
31 1/2	16	3 15/16	B	23.60
37	19	3 15/16		30.00
41 1/4	21	3 15/16	B	34.00
48 3/4	25	3 15/16	B	40.00
71	36	3 15/16	B	70.00

NO. 142

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
10 1/2	4	2 15/16	A	3.95
13 1/4	5	2 15/16	A	4.50
15 1/2	6	2 15/16	A	5.50
18 1/4	7	2 15/16	A	7.30
20 1/2	8	2 15/16	A	8.00
23 1/4	9	2 15/16	A	9.00
28 1/4	11	2 15/16	A	11.80
31	12	2 15/16	A	13.20
36	14	2 15/16	A	16.00

NO. 188

Diameter, Inches	No. of Teeth	Largest Bore, Ins. at Reg. Price	Kind	Each
4 1/2	5	1		2.75*
5 1/4	6	1 3/16		2.90*
6	7	1 11/16		3.10*
6 3/4	8	1 15/16		3.30*
7 3/4	9	2 3/16		3.50*
8 1/2	10	2 7/16		3.75*
9 1/2	11	2 11/16		4.00*
10 1/2	12	2 15/16		4.30*
11	13	2 15/16		4.60*
12	14	2 15/16		4.90
13	15	2 15/16		5.20
14	16	2 15/16		5.55
14 1/2	17	2 15/16		5.90
15 1/4	18	2 15/16		6.25
16 1/2	19	2 15/16		6.60
16 3/4	20	2 15/16		6.95
17 1/2	21	2 15/16		7.30
18 1/2	22	2 15/16		7.65
19 1/4	23	2 15/16		8.00
20 1/2	24	2 15/16		8.35
21	25	2 15/16		8.70
22	26	2 15/16		9.05
22 1/2	27	2 15/16		9.40
23 1/2	28	2 15/16		9.75
24 1/4	29	2 15/16		10.10
25 1/2	30	2 15/16		10.45
26 3/4	32	2 15/16		11.15
27 3/4	33	2 15/16		11.55
28 1/2	34	2 15/16		11.95
29 1/4	35	2 15/16	B	12.35
30 1/4	36	2 15/16		12.75
31	37	2 15/16		13.20
32	38	2 15/16		13.65
32 3/4	39	2 15/16		14.10
33 3/4	40	2 15/16		14.60
36	43	2 15/16		16.20
37	44	2 15/16		16.75
37 3/4	45	2 15/16		17.30
38 1/2	46	2 15/16		17.85
41 1/4	49	2 15/16		19.50
42	50	2 15/16		20.00
48	57	2 15/16		24.25
50 1/4	60	2 15/16	B	26.00
54 1/2	65	2 15/16	B	30.00
60 1/4	72	2 15/16	B	35.00
64 1/2	77	2 15/16		40.00
67	80	2 15/16		42.50

*Plate center wheels; all others have arms.

Note—Extra charges for large bores, large hubs, split hubs, set screw over keyway; and facing both ends of hub

MALLEABLE ROLLER CHAINS

Inexpensive roller chain, well adapted to wood and steel apron conveyors; also to elevators and conveyors handling non-adhesive, non-gritty bulk materials. Made up with riveted pins unless otherwise ordered. Chains made up with coupling pins throughout on order only. With all riveted chains, coupling pins are furnished to join the ends so that they can be readily coupled.

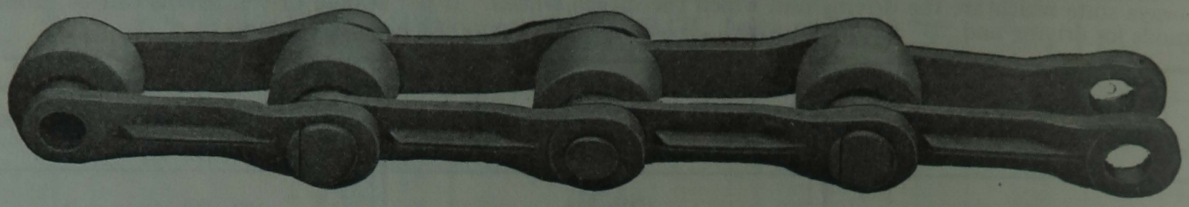


Fig. 1850
No. T-538

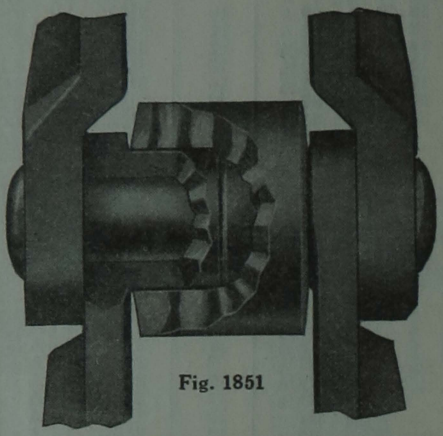


Fig. 1851

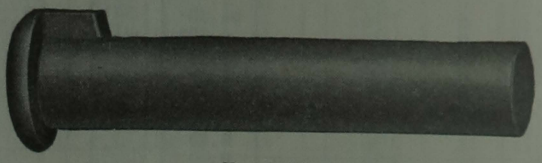


Fig. 1852
No. T538B.

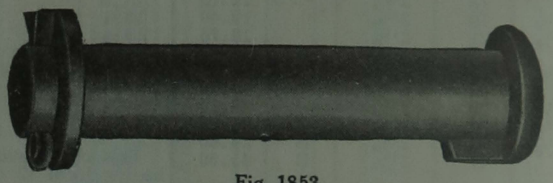


Fig. 1853
No. T-538-C

Chain Nos.	Pitch, Inches	Approximate Weight per Foot, Lbs.	‡Working Strength at 150 Feet per Minute, Lbs.	**Maximum Speeds Feet per Minute	Dimensions in Inches		
					Over-all Width	Diameter, Roller	Diameter, Pins
0	2.02	1.39	670	700	1 11/16	15/16	5/16
1*	2.98	5.22	2575	600	3	1 7/16	5/8
1½	2.98	6.00	2575	600	3	1 9/16 Steel	5/8
2*†	3.70	4.39	1850	600	3	1 13/32	5/8
2 Spc†	3.70	4.97	1850	600	3	1 3/4	5/8
3†	4.04	5.54	3000	500	3 1/2	1 3/4	11/16
3½	4.04	6.40	3000	500	3 1/2	2	11/16
5	5.08	8.52	4425	500	3 3/4	2 1/32	7/8
5-C†	5.08	8.82	4425	500	3 3/4	2 1/2	7/8
9†	2.98	1.51	950	700	1 7/8	1	3/8
9 Spc	2.98	2.24	950	700	2	1 13/64	3/8
9½	2.98	1.92	950	700	1 7/8	1 1/2	3/8
9½ Sp†	2.98	2.65	950	700	2	1 1/2	3/8
12	3.53	3.47	2050	600	2 3/4	1 9/32	1/2
14†	4.01	3.03	1600	600	2 1/2	1 7/16	1/2
14½†	4.01	3.30	1600	600	2 1/2	2	1/2
17*†	2.58	2.35	1000	700	2 1/4	1 5/32	7/16
18†	3.03	2.76	1475	700	2 1/4	1 19/64	1/2
20*	1.52	.84	500	700	1 3/8	21/32	1/4
40½	4.00	2.93	900	600	2	2	3/8
52*	1.50	1.20	600	700	1 7/8	1 1/16	9/16
55	1.62	.97	600	700	1 7/8	1 1/16	5/16
62	1.67	2.07	900	700	2 1/4	57/64	11/32
77*†	2.29	1.57	750	700	2	7/8	3/8
124*	4.05	7.23	3300	500	3 5/8	1 3/4	3/4
126†	6.01	5.70	3100	400	3 5/16	2 1/4	11/16
126-C†	6.01	7.70	3100	400	3 5/16	3	11/16
137	6.96	9.65	5300	300	4 3/8	2 3/4	7/8
156†	6.01	9.00	5000	300	3 3/4	2 1/4	7/8
156-C†	6.01	9.20	5000	300	3 3/4	3	7/8

Bold face type indicates stock Nos.

*Sizes recommended for transmitting power, used also for conveyors.

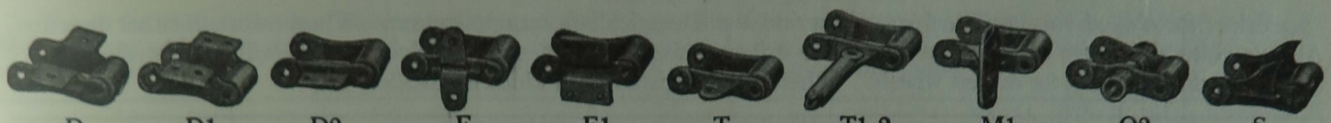
†Sizes recommended for elevators and conveyors, used also for Drives.

‡Working strengths in table are increased or decreased for speeds other than 150 feet per minute. Use half of values thus obtained for service in gritty materials.

**Economical speeds are half of maximum speeds.

ATTACHMENTS FOR MALLEABLE ROLLER CHAIN

STANDARD STOCK ATTACHMENTS

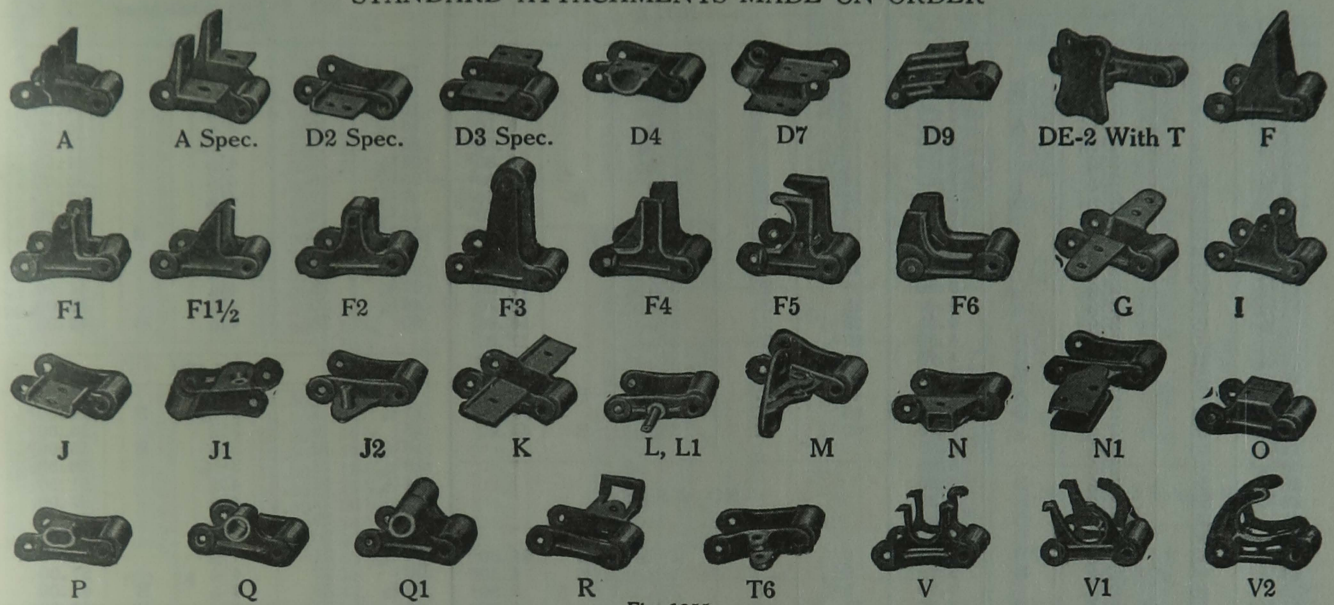


D D Spec.* | D1 D1 Spec.* | D2 | E | E1 E1 Spec.† | T Standard and Heavy§ | T1-2 With T | M1 With T | Q2 | S

Fig. 1854

*Heavier Wings than D and D1. †Same as E1 but tapered for Standard Buckets. §T lug heavier than "Standard."

STANDARD ATTACHMENTS MADE ON ORDER



A | A Spec. | D2 Spec. | D3 Spec. | D4 | D7 | D9 | DE-2 With T | F

F1 | F1½ | F2 | F3 | F4 | F5 | F6 | G | I

J | J1 | J2 | K | L, L1 | M | N | N1 | O

P | Q | Q1 | R | T6 | V | V1 | V2

Fig. 1855

Chain NOS.	Per Ft.
O—Plain	$0.70
D Both Sides	.95
1—Plain	1.65
D Both Sides	2.20
1½ D Special—Both Sides	3.60
2—Plain	1.40
D-1 Special Both Sides	1.90
D-2 One Side	1.62
T-One Side	1.57
T & M-1 One Side	2.40
T & T-1 T-2 One Side, 1¼ inch Pipe	2.72
2 Special—Plain	1.58
D-1 Special Both Sides	2.08
D-2 One Side	1.80
T One Side	1.75
T & M-1 One Side	2.58
T & T-1 T-2 One Side, 1¼ inch Pipe	2.90
3—Plain	1.84
D-1 Both Sides	2.34
D-2 One Side	2.17
D-2 Special One Side	2.30
G Both Sides	2.55
3½—Plain	1.94
D-1 Both Sides	2.44
D-2 One Side	2.27
3½ D-2 Special One Side	$2.40
G Both Sides	2.65
5—Plain	2.50
S Both Sides	3.80
5C—Plain	2.70
S Both Sides	4.00
9—Plain	.65
D Both Sides	.84
D-2 One Side	.80
Q Both Sides	.90
T One Side	.85
T & M-1 One Side	1.63
9½—Plain	.80
D Both Sides	.99
D-2 One Side	.95
Q Both Sides	1.05
T One Side	1.00
T & M-1 One Side	1.78
9 Special—Plain	.84
D-1 Both Sides	1.12
D-2 One Side	1.03
T one Side	1.05
T & M-1 One Side	1.83
9½ Spec.—Plain	.91
D-1 Both Sides	1.19
D-2 One Side	1.10
T One Side	1.12
T & M-1 One Side	1.90
12—Plain	1.20
D-2 One Side	1.42
14—Plain	1.03
14—D-1 Both Sides	$1.37
D-2 One Side	1.22
Q-1 One Side	1.32
Q-2 Both Sides	1.62
T One Side	1.20
T & M-1 Special One Side	1.74
T & T-1 T-2 One Side 1¼ inch Pipe	2.26
14½—Plain	1.21
D-1 Both Sides	1.55
D-2 One Side	1.40
Q-1 One Side	1.50
Q-2 Both Sides	1.80
T One Side	1.38
T & M-1 Special One Side	1.92
T & T-1 T-2 One Side 1¼ inch Pipe	2.44
17—Plain	.90
A Both Sides	1.40
D Both Sides	1.23
D-1 Special Both Sides	1.52
E One Side	1.05
T One Side	1.10
T & M-1 One Side	2.20
18—Plain	.95
D Both Sides	1.34
T One Side	1.20
20—Plain	.65
40½—Plain	.80
D-2 One Side	1.05
52—Plain	$0.90
D Both Sides	1.10
55—Plain	.75
D Both Sides	1.00
62—Plain	1.03
G Both Sides	1.55
77—Plain	.75
D Both Sides	1.00
T One Side	.95
T & M-1 One Side	1.95
124—Plain	2.10
126—Plain	1.60
D-1 Both Sides	2.30
D-2 One Side	2.00
E-1 One Side	2.25
T Heavy One Side	2.10
T Heavy & M-1 Special One Side	2.95
126-C—Plain	1.80
D-1 Both Sides	2.10
D-2 One Side	1.80
E-1 One Side	2.05
T Heavy One Side	1.90
T Heavy & M-1 Special One Side	2.75
137—Plain	2.65
D-7 Both Sides	4.25
156—Plain	2.45
D-1 Both Sides	3.65
D-2 One Side	2.90
156-C—Plain	2.75
D-2 Both Sides	3.95
D-2 One Side	3.20

Stock Nos. are indicated by bold face type

CAST-IRON SPROCKET WHEELS FOR MALLEABLE ROLLER CHAIN

Prices for chilled rim and steel sprockets and for flanged idlers on application. Wheels work in either direction. Always state which are driving and which are driven wheels. If not stated, driven wheels will be furnished. "A" stands for driving, "B" for driven wheels. Where not indicated both kinds are made.

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
No. 0				
3	4	1 3/16		$1.20*
3 1/2	5	1 3/16	B	1.40*
4 1/4	6	1 7/16		1.50*
4 3/4	7	1 11/16	A	1.90*
5 1/2	8	1 15/16		2.00*
6	9	2 3/16		2.10*
6 1/2	10	2 7/16		2.25*
7	11	2 7/16	A	2.60*
8	12	2 7/16		2.80*
8 1/2	13	2 7/16		3.00*
9 1/4	14	2 7/16		3.20*
9 3/4	15	2 7/16		3.30
10 3/4	17	2 7/16		3.50
11 1/2	18	2 7/16		4.00
12 1/4	19	2 7/16		4.25
13	20	2 7/16	B	4.50
13 3/4	21	2 7/16	B	4.75
14	22	2 7/16	B	4.75
15	23	2 7/16	A	5.00
15 1/2	24	2 7/16	B	5.50
16 1/4	25	2 7/16		5.75
18 1/4	28	2 7/16		6.00
20 1/4	31	2 7/16		6.25
22	34	2 7/16	B	7.25
22 1/2	35	2 7/16	B	7.90
23 1/4	36	2 7/16	B	8.50
24 1/2	38	2 7/16	B	8.75
27 1/4	42	2 7/16	B	9.00
28 1/2	44	2 7/16	B	9.25
30	46	2 7/16		9.75
31 3/4	49	2 7/16	B	13.00
33 1/4	51	2 7/16		15.00
48	74	2 7/16	B	25.00
NO. 1				
6	6	1 15/16		$3.50*
7 3/4	8	2 3/16		4.25*
8 3/4	9	2 7/16		4.75*
9 1/4	10	2 15/16		7.00*
10 1/2	11	3 7/16		7.25*
11 1/2	12	3 7/16		7.50*
12 1/2	13	3 7/16		7.75*
13 1/2	14	3 7/16		8.00*
14 1/4	15	3 7/16		10.50*
15 1/4	16	3 7/16		12.00*
16 1/4	17	3 7/16		12.25*
17 1/2	18	3 7/16		12.60
18 1/4	19	3 7/16		12.80
19 1/4	20	3 7/16		13.80
20	21	3 7/16		14.50
21	22	3 7/16	B	15.00
23	24	3 7/16		15.80
24	25	3 7/16		16.50
25 3/4	27	3 7/16		17.50
28	29	3 7/16		18.25
29 3/4	31	3 7/16		19.00
32 1/2	34	3 7/16	B	21.00
36 1/4	38	3 7/16		23.00
42	44	3 7/16		28.00
48	50	3 7/16		37.50
NO. 1 1/2				
5.96	6	1 15/16		$3.50
9.64	10	2 15/16		7.00
10.57	11	3 7/16		7.25
11.51	12	3 7/16		7.50
12.45	13	3 7/16		7.75
18.10	19	3 7/16		12.80
23.78	25	3 7/16		16.50

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
NO. 2				
6 1/2	5	1 15/16		$3.50*
8 1/2	7	1 15/16		4.00*
9 3/4	8	2 3/16		5.40*
11	9	2 7/16		6.10*
12 1/4	10	2 15/16		7.70*
13 1/2	11	3 7/16		9.60*
14 1/2	12	3 7/16		10.20*
15 1/2	13	3 7/16	B	10.50*
16 1/2	14	3 7/16		10.70*
18 1/4	15	3 7/16		13.10*
20	17	3 7/16		14.50
22 3/4	19	3 7/16		15.00
24	20	3 7/16		15.50
25	21	3 7/16		16.10
28 1/2	24	3 7/16		16.60
29 3/4	25	3 7/16		17.20
31	26	3 7/16		17.50
35 3/4	30	3 7/16		21.50
44	37	3 7/16	B	32.00
48	40	3 7/16		35.00
60 3/4	51	3 7/16	B	45.00
NO. 2 Special				
6 1/2	5	1 15/16	B	$4.00*
8 1/2	7	1 15/16	B	4.50*
9 3/4	8	2 3/16		5.00*
11	9	2 7/16		5.70*
12	10	2 15/16		6.60*
13 1/4	11	3 7/16		7.70*
14 1/2	12	3 7/16		8.80*
15 3/4	13	3 7/16		9.10
16 3/4	14	3 7/16		9.40
18	15	3 7/16		11.20
20 1/2	17	3 7/16		12.00
24	20	3 7/16		13.00
27 1/2	23	3 7/16		16.50
28 3/4	24	3 7/16	B	17.00
29 3/4	25	3 7/16		17.50
31	26	3 7/16		20.00
35 3/4	30	3 7/16		24.70
37	31	3 7/16	B	28.00
44	37	3 7/16		35.00
59 1/2	50	3 7/16	B	55.00
No. 3				
8 1/4	6	2 7/16		$5.00*
10 1/2	8	2 15/16		9.60*
12	9	3 3/16		12.00
13 1/4	10	3 3/16		12.50
14 1/2	11	3 7/16		13.80
15 1/2	12	3 11/16		14.50
17 1/4	13	3 15/16		15.00
18 1/2	14	3 15/16		15.50
21 1/4	16	3 15/16		16.50
22 1/2	17	3 15/16		17.20
23 3/4	18	3 15/16		18.60
24 3/4	19	3 15/16		20.50
26 1/4	20	3 15/16		21.00
29 3/4	23	3 15/16		22.00
31 1/4	24	3 15/16		23.50
36 1/2	28	3 15/16		24.50
38 1/2	30	3 15/16	B	27.50
40	31	3 15/16		29.50
42 3/4	33	3 15/16		31.50
44 3/4	35	3 15/16	B	33.50
46 3/4	36	3 15/16	B	36.50
48	37	3 15/16		39.00
61 3/4	48	3 15/16	B	60.00
72 3/4	56	3 15/16	B	78.50

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
NO. 3 1/2 on Application NO. 5				
12	7	2 15/16		$12.00*
13 1/2	8	2 15/16		13.00*
15	9	3 3/16		14.00*
16 1/2	10	3 7/16		15.00*
20	12	3 15/16		18.50
24 1/2	15	4 7/16		21.50
26 1/4	16	4 7/16		23.00
27 1/2	17	4 7/16		27.00
31 1/4	19	4 7/16		28.00
32 3/4	20	4 7/16	B	30.00
34	21	4 7/16		32.00
36	22	4 7/16		37.00
37 3/4	23	4 7/16		41.00
49 1/4	30	4 7/16		56.00
60	38	4 7/16	B	72.00
NO. 5-C				
11 3/4	7	2 15/16	B	$12.00*
15	9	3 3/16		14.00*
16 1/2	10	3 7/16	B	15.00*
19 3/4	12	3 15/16		18.50
24 1/2	15	4 7/16		21.50
27 3/4	17	4 7/16		27.00
31	19	4 7/16		28.00
32 1/2	20	4 7/16		30.00
34 1/4	21	4 7/16		32.00
36	22	4 7/16		37.00
40 3/4	25	4 7/16	B	43.00
44	27	4 7/16	B	48.00
48 3/4	30	4 7/16		56.00
NO. 9				
5 1/4	5	1 7/16		$2.50*
6	6	1 7/16		2.80*
7 1/4	7	1 15/16		3.20*
8 1/4	8	2 3/16		3.60*
8 3/4	9	2 7/16	B	3.90*
10	10	2 7/16		4.30
11 1/2	12	2 7/16		4.80
12 1/2	13	2 7/16		6.20
14 1/2	15	2 7/16		7.00
16 1/2	17	2 7/16		7.50
18 1/4	19	2 7/16		8.00
20	21	2 7/16		9.00
23	24	2 7/16	B	9.50
24	25	2 7/16		9.90
25 3/4	27	2 7/16	B	10.50
30	31	2 7/16		12.50
35	37	2 7/16		14.50
40 1/2	42	2 7/16		17.00
48 1/2	51	2 7/16		25.00
60	63	2 7/16	B	57.00
NO. 9 Special				
5	5	1 7/16	B	$1.80*
6	6	1 7/16	B	2.30*
6 3/4	7	1 15/16	B	3.20*
8	8	2 3/16		3.70*
8 3/4	9	2 7/16	B	4.30*
9 3/4	10	2 7/16		4.50*
10 1/2	11	2 7/16		5.00*
11 3/4	12	2 7/16		5.60*
12 1/2	13	2 7/16		6.50*
14 1/2	15	2 7/16		7.00
16 1/2	17	2 7/16		7.50
18 1/4	19	2 7/16		8.50
19 1/4	20	2 7/16		9.00
20 1/4	21	2 7/16		9.50
24	25	2 7/16		11.00
28 3/4	30	2 7/16		12.50
40 1/2	42	2 7/16	B	17.00

*Plate center wheels; all others have arms.

Extra charges for large bores, large hubs, split hubs, facing both hubs and set screw over keyway.

CAST-IRON SPROCKET WHEELS FOR MALLEABLE ROLLER CHAINS

(Continued)

Prices for chilled rim and steel sprockets and for flanged idlers on application. Wheels work in either direction. Always state which are driving and which are driven wheels. If not stated, driven wheels will be furnished. "A" stands for driving; "B" for driven wheels. When not indicated both kinds are made.

NO. 9½, 1½-inch Roller
9½ Special, 1½-inch Roller

Diameter, Inches	No. of Teeth	Largest Bore, Ins., at Reg. Price	Kind	Each
6	6	1 1/16	B	$2.30*
7	7	1 13/16	B	3.20*
8	8	2 3/16	B	3.75*
8 3/4	9	2 7/16		4.30*
9 3/4	10	2 7/16		4.50*
10 3/4	11	2 7/16		5.00*
11 3/4	12	2 7/16		5.60*
12 1/2	13	2 7/16		6.50
14 1/4	15	2 7/16		7.00
15 1/2	16	2 7/16	B	7.25
16 1/4	17	2 7/16		7.50
18 1/4	19	2 7/16		8.50
19 1/4	20	2 7/16	B	9.00
20 1/4	21	2 7/16		9.50
22	23	2 7/16		10.50
24 1/4	25	2 7/16	B	11.00
29 3/4	31	2 7/16		12.50
40 1/2	42	2 7/16	A	17.00

NO. 12

7	6	1 15/16	B	$8.50*
9 1/4	8	2 7/16		9.50*
11 1/2	10	2 15/16		10.00*
12 1/2	11	2 15/16		10.50*
16 3/4	14	3 7/16		11.00
20 1/2	18	3 7/16		11.50
23 3/4	21	3 7/16		13.00
31 3/4	28	3 7/16		20.00
36 1/4	32	3 7/16	A	22.00

NO. 14

6 3/4	5	1 15/16		$4.50*
9 1/4	7	2 3/16		6.00*
10 1/2	8	2 7/16		6.50*
11 1/2	9	2 15/16		7.00*
14 1/2	11	2 15/16		7.50*
15 1/2	12	2 15/16		8.00
18	14	2 15/16	B	10.00
19 1/2	15	2 15/16		12.00
20 3/4	16	2 15/16	B	13.00
23	18	2 15/16	B	13.75
24 1/2	19	2 15/16		14.00
29 3/4	23	2 15/16		19.00
34 3/4	27	2 15/16		23.00
40	31	2 15/16		25.00
47 1/2	37	2 15/16		36.00

NO. 14½

9 1/4	7	2 3/16	B	$6.00*
10 1/2	8	2 7/16		6.50*
11 3/4	9	2 15/16		7.00*
14 1/4	11	2 15/16	B	7.50*
15 3/4	12	2 15/16		8.00
19 1/2	15	2 15/16		12.00
20 3/4	16	2 15/16		13.00
24 3/4	19	2 15/16		14.00
29 3/4	23	2 15/16		19.00
34 3/4	27	2 15/16		23.00
39 3/4	31	2 15/16		25.00
47 1/2	37	2 15/16	B	36.00

NO. 17

4 1/2	5	1 15/16		$1.85*
5	6	1 15/16		2.40*
6	7	2 3/16		2.90*
6 3/4	8	2 7/16		3.50*
7 1/2	9	2 15/16		4.00*
8 1/2	10	2 15/16		4.50*
9	11	2 15/16		5.10*
10	12	2 15/16		5.60*
11 3/4	14	2 15/16		6.70*
12 1/2	15	2 15/16		7.80*
13 1/4	16	2 15/16	B	8.60*
14 3/4	18	2 15/16		9.70*
15 3/4	19	2 15/16		10.20*
18 1/4	22	2 15/16		11.60
20	24	2 15/16		13.50
23 1/4	28	2 15/16	B	14.25
24	29	2 15/16		15.40
25	30	2 15/16	A	16.25

NO. 17—Continued

28 1/2	34	2 15/16		$18.00
30	36	2 15/16		20.00
32 1/4	39	2 15/16	B	21.00
35 1/2	43	2 15/16		22.00
36 1/4	44	2 15/16	A	23.00
39 3/4	48	2 15/16	B	26.00
44 1/2	54	2 15/16	B	33.00
48	58	2 15/16	B	39.00
59 1/2	72	2 15/16	B	45.00

NO. 18

6	6	1 15/16	B	$2.40*
7	7	2 3/16	B	3.05*
8	8	2 7/16		4.00*
9	9	2 15/16		5.20*
10	10	2 15/16		6.00*
10 3/4	11	2 15/16		7.10*
12	12	2 15/16		7.50*
12 1/2	13	2 15/16		8.00
13 1/2	14	2 15/16		8.90
14 3/4	15	2 15/16		9.40
16	16	2 15/16		10.20
16 1/2	17	2 15/16		11.00
17 3/4	18	2 15/16		11.70
18 1/2	19	2 15/16		12.60
19 1/2	20	2 15/16		13.60
20 1/2	21	2 15/16		14.70
24 1/2	25	2 15/16		15.90
25 1/4	26	2 15/16		17.00
27 1/4	28	2 15/16		17.90
31	32	2 15/16		18.90
34	35	2 15/16	B	20.00
36 1/4	37	2 15/16		23.00
36 3/4	38	2 15/16	B	25.00
40 3/4	42	2 15/16		26.00
44 3/4	46	2 15/16	B	27.00
48 1/2	50	2 15/16		28.00
59 1/4	61	2 15/16	B	38.00

NO. 20

2	4	1 7/16	B	$1.00*
2 3/4	6	1 7/16	B	1.30*
3 1/2	7	1 7/16		1.70*
4 1/2	9	2 3/16		2.10*
5 1/4	11	2 7/16		2.40*
5 3/4	12	2 7/16		3.20*
6 1/4	13	2 7/16	B	3.30*
7	14	2 7/16		3.70*
7 1/2	15	2 7/16	B	4.15
8 1/2	17	2 7/16		4.50
9 1/2	19	2 7/16	A	5.10
9 3/4	20	2 7/16		5.50
10 1/2	21	2 7/16		5.90
11 1/4	23	2 7/16		6.20
12 1/4	25	2 7/16	B	6.40
13 1/4	27	2 7/16		6.70
14 1/2	30	2 7/16	B	6.85
16	33	2 7/16		7.10
20 1/2	42	2 7/16		7.25
25	51	2 7/16	B	7.50

NO. 40½

9 1/4	7	2 3/16	B	$6.00*
10 1/2	8	2 3/16		6.50*
15 1/2	12	2 7/16		8.00
19 1/2	15	2 7/16	B	12.00
21 3/4	17	2 7/16		13.00
24 1/2	19	2 7/16		14.00
29 1/2	23	2 7/16		18.00
39 3/4	31	2 7/16	A	25.00

NO. 52

3	6	1 15/16	B	$1.50*
3 1/2	7	1 15/16		1.65*
4 1/2	8	1 15/16		1.80*
4 3/4	10	1 15/16	B	2.00*
5 1/2	11	1 15/16		2.10*
6	12	1 15/16		2.20*
7 3/4	16	1 15/16		2.70
8 1/4	17	1 15/16		2.80
9 3/4	20	1 15/16		3.00

NO. 52—Continued

10	21	1 15/16	B	$3.10
10 1/2	22	1 15/16	B	3.40
11 3/4	24	1 15/16		3.55
12	25	1 15/16		3.70
14	29	1 15/16		4.00
16 1/4	34	1 15/16	B	4.50
17 3/4	37	1 15/16	B	4.70
20 1/4	42	1 15/16		5.30
22	46	1 15/16	B	5.90
24	50	1 15/16	B	6.20
25	52	1 15/16	B	6.60
25 1/2	53	1 15/16	A	6.80
30 3/4	64	1 15/16		8.80
32 1/4	67	1 15/16	B	10.00
40 1/2	84	1 15/16	B	16.00

NO. 55

3 3/4	7	1 3/16	B	$1.75*
4 1/4	8	1 7/16		1.85*
5 1/4	10	1 15/16	A	2.60*
6 1/4	12	1 15/16	B	2.30*
8	15	1 15/16	A	2.60*
8 3/4	17	1 15/16		2.90*
10	19	1 15/16	B	3.00
12	23	1 15/16		3.50
15	29	1 15/16		4.10
17 3/4	34	1 15/16		4.90
18 1/4	35	1 15/16	A	5.00
20 1/4	39	1 15/16	B	5.50
21 1/2	42	1 15/16		6.00

NO. 62

3 1/4	6	1 3/16		$1.80*
3.85	7	1 3/16		1.90*
4 1/2	8	1 7/16	B	2.00*
4 3/4	9	1 15/16	B	2.10*
5 1/2	10	2 1/16		2.20*
6	11	2 7/16	B	2.30*
6 1/2	12	2 7/16	B	2.50*
8	15	2 7/16	B	3.00*
8 1/2	16	2 7/16	A	3.40*
9	17	2 7/16	B	3.75*
10 1/4	19	2 7/16	B	4.00
12	22	2 7/16		4.25
12 1/4	23	2 7/16		4.50
13 1/2	25	2 7/16	B	4.75
14 1/2	28	2 7/16		5.00
16	30	2 7/16	A	5.50
18 1/4	34	2 7/16		6.00
20	37	2 7/16		6.50
21 1/4	40	2 7/16	B	7.20
25	47	2 7/16		8.00
36	65	2 15/16		18.00

NO. 77

4 1/2	6	1 7/16	B	$2.70*
5 1/4	7	1 11/16		2.85*
6	8	1 15/16		3.00*
6 3/4	9	2 3/16		3.20*
7 1/4	10	2 7/16		3.40*
8	11	2 7/16		3.60*
9	12	2 7/16		3.80*
9 3/4	13	2 7/16		4.00*
10 1/2	14	2 7/16		4.20*
11	15	2 7/16		4.40*
11 3/4	16	2 7/16		4.60
13 1/2	18	2 7/16		5.00
14	19	2 7/16	A	5.25
14 3/4	20	2 7/16		5.50
16	22	2 7/16		6.00
18 1/2	25	2 7/16		6.75
19 1/2	27	2 7/16	B	7.25
22 1/4	30	2 7/16		8.20
24	33	2 7/16		9.40
25 1/2	35	2 7/16		10.25
29 1/2	40	2 7/16		12.50
31 1/2	43	2 7/16		13.75
36	49	2 7/16	B	16.25
39 1/2	54	2 7/16	B	18.50
52 3/4	72	2 7/16	B	32.00

NO. 124

8 1/4	6	2 7/16	A	$10.00*
9 1/2	7	2 11/16	B	10.50*
12	9	2 15/16		13.50*
13 1/4	10	3 3/16		15.00*
14 1/2	11	3 7/16		16.00*
15 3/4	12	3 15/16		17.50
17	13	3 15/16	A	18.00
18 1/4	14	3 15/16		18.50
19 1/2	15	3 15/16		19.00
21	16	3 15/16		19.50
23 1/2	18	3 15/16		20.00
25	19	3 15/16		21.50
26	20	3 15/16		22.50
27 1/2	21	3 15/16		23.50
31 1/4	24	3 15/16		26.50
34	26	3 15/16		30.00
36 1/2	28	3 15/16		32.50
40 3/4	31	3 15/16		36.00
42 3/4	33	3 15/16	B	37.50
45 1/2	35	3 15/16	B	39.00
48 3/4	37	3 15/16		43.00
60	46	3 15/16	B	52.00
72 3/4	56	3 15/16	A	66.00
78	60	3 15/16		80.00

NO. 126, 2¼-inch Roller

10 1/4	5	2 15/16	B	$5.50*
12	6	3 7/16		7.00*
14	7	3 7/16		8.50*
17 3/4	9	3 7/16		11.80*
19 3/4	10	3 7/16		14.50
23 3/4	12	3 7/16		19.00
25 1/2	13	3 7/16		20.50
27 1/4	14	3 7/16		22.50
29 1/4	15	3 7/16		25.00
35	18	3 7/16		28.00
37	19	3 7/16		30.00
42 3/4	22	3 7/16	B	37.50
48 1/2	25	3 7/16		42.00

NO. 126-C, 3-inch Roller

12 1/4	6	3 7/16		$7.00*
14	7	3 7/16	B	8.50*
16	8	3 7/16		9.10*
17 3/4	9	3 7/16		11.80
19 3/4	10	3 7/16		14.50
21 3/4	11	3 7/16	B	17.00
23 3/4	12	3 7/16		19.00
25 1/2	13	3 7/16	A	20.50
27 1/2	14	3 7/16		22.50
29 1/4	15	3 7/16		25.00
30 3/4	16	3 7/16	B	26.00
35 1/4	18	3 7/16		28.00
37	19	3 7/16	B	30.00
48 3/4	25	3 7/16		42.00
60	31	3 7/16		58.00

NO. 137

18 1/4	8	4 7/16	B	$18.00*
25	11	4 15/16		25.50
31 1/2	14	4 15/16		35.00
36	16	4 15/16		38.00
47 1/4	21	4 15/16	A	47.00
49 1/2	22	4 15/16	B	50.00

NOS. 156 and 156-C

Use respectively same wheels as for NOS. 126 and 126-C.

*Plate center wheels; all others have arms.

Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs and set screw over keyway on previous page.

STEEL THIMBLE ROLLER CHAINS

Smaller sizes make excellent drive chains while the larger sizes are especially adapted to aprons, elevators and conveyors for heavy duty. Should not be used in direct contact with sticky or gritty material. Chains are hardened by special process. The thimble is fixed rigidly to the side bar; notched on both ends to fit key effect on side bars, preventing its rotation with roller and insuring perfect alignment. Wear distributed full length of thimble. All parts are interchangeable.

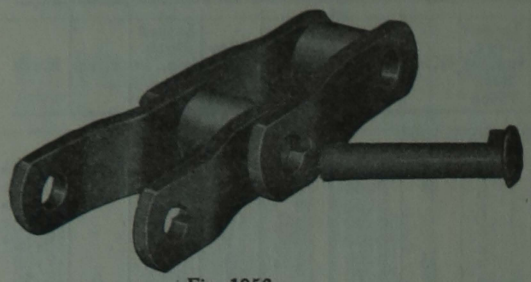


Fig. 1856
No. T-539

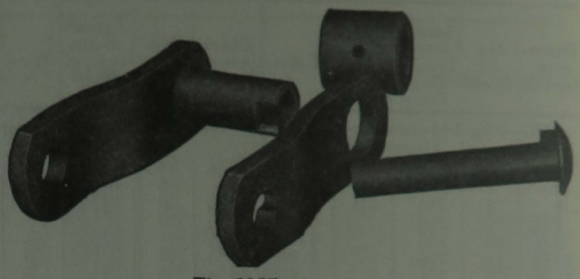


Fig. 1857
No. T-539A

Chain NOS.	*** Style	Pitch, Inches	Approx. Wt., Lbs. per Foot	‡Working Strength at 150 Feet per Min., Lbs.	** Max. Speed, Feet per Min.	Works on Sprocket Nos.	Dimensions in Inches					Per Foot
							Side Bars		Dia. Pin	Overall Width	Dia. §Roller	
							Width	Thick				
14*	O	3.51	11.30	3700	500	14	1½	½	⅝	3¾	1⅝-S	$2.10
17*	O	2.56	5.10	2100	700	17	1¼	¼	½	2⅝	1⅛-S	2.00
112*	O	4.04	15.70	5600	400	112	2	½	¾	4⅛	1⅞-S	2.70
120*	O	3.07	7.10	3100	600	120	1⅜	5/16	9/16	3	1¼-S	1.50
126-D*	O	6.0	8.70	3700	400	126	1½	½	⅝	3¾	2¼-S	1.50
126-DC†	O	6.0	9.40	3700	400	126-C	1½	½	⅝	3¾	3-C	1.50
180†	S	12.0	14.20	6500	200	180	2½	⅜	⅞	4⅝	4-CF	2.00
182½†	S	18.0	18.60	9700	150	182	2½	½	1	5⅜	5-CF	2.00
276†	S	12.0	12.20	5200	300	180	2½	5/16	¾	3⅞	4-CF	1.50
433½*	O	2.62	3.40	1900	700	88-J	1⅛	¼	7/16	2⅝	⅞-S	1.25
809†	S	9.0	13.0	4500	350	809	2½	¼	¾	3⅝	3½-CF	1.75
950*	S	1.5	.....	2100	800	950	1⅛	3/16	⅜	1⅞	¾-S	1.40
951	S	6.0	9.25	3750	450	126-C	2	⅜	⅝	3¼	3-C	1.40

*Sizes recommended for transmitting power, used also for conveyors.

†Sizes recommended for elevators and conveyors, used also for transmitting power.

‡Working strengths in table are increased or decreased for speeds other than 150 feet per minute. Use half of values thus obtained for service under gritty conditions.

**Economical speeds are half of maximum speeds in above table.

§Roller dimensions: S is steel roller without flange; C is cast-iron roller without flange; CF is cast-iron roller with flange.

***Style S or O refers to straight or offset links.

ATTACHMENTS FOR STEEL THIMBLE ROLLER CHAINS

D-11½
For Perfect Discharge Aprons

D-2 (Steel)

D-6 (Steel)
K-2 on Nos. 14 and 116

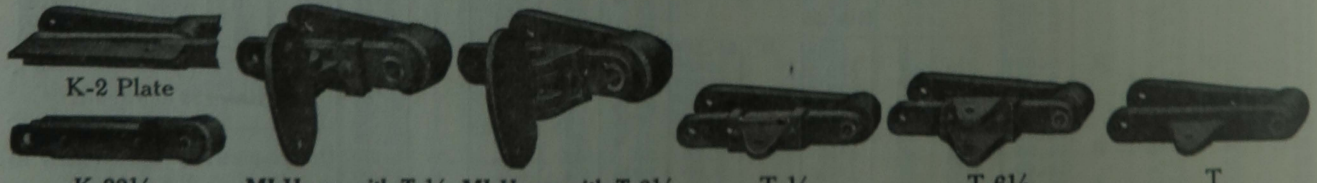
D-7 (Steel)

D-11
For Double Beaded Aprons

E-1 (Steel)

E-1½ (Malleable)

Fig. 1858



K-2 Plate

K-33½

MI Heavy with T-½ (Malleable)

MI Heavy with T-6½ (Malleable)

T-½ (Malleable)

T-6½ (Malleable)

T (Steel)

Fig. 1859

Price on Application

CAST-IRON SPROCKETS FOR STEEL THIMBLE ROLLER CHAINS

Prices for chilled rim and steel sprockets, and for flanged idlers on application.

Always state which are the driving and which are the driven wheels. If not stated driven wheels will ordinarily be furnished. "A" stands for driving and "B" for driven wheel. When not indicated, both kinds are made.

NO. 14

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
6 1/4	5	2 7/16		$4.50*
7	6	2 7/16		5.10*
8 1/4	7	2 11/16		5.70*
9	8	2 15/16		6.50*
10 1/2	9	2 15/16		7.80*
11 1/2	10	2 15/16		11.60*
12 1/2	11	3 3/16		14.00*
13 1/2	12	3 7/16		16.00*
14 1/2	13	3 11/16		17.00*
16	14	3 15/16		18.00
17	15	3 15/16		19.00
18	16	3 15/16		20.00
19	17	3 15/16		21.00
20 1/4	18	3 15/16		22.00
21 1/2	19	3 15/16		23.00
22 1/2	20	3 15/16		24.00
23 1/2	21	3 15/16		25.00
24 3/4	22	3 15/16	B	28.00
27	24	3 15/16	B	32.50
28 1/4	25	3 15/16		33.50
30	27	3 15/16		35.00
32 3/4	29	3 15/16		36.00
35 1/2	32	3 15/16		37.00
37 1/4	33	3 15/16	A	38.50
39	35	3 15/16	B	39.00
40 1/2	36	3 15/16		40.00
42 1/2	38	3 15/16		42.00
48 1/4	43	3 15/16		52.00
56 1/4	50	3 15/16	A	67.00
62 3/4	56	3 15/16	B	77.00

NO. 17

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
5 1/4	6	1 15/16		$4.00*
6	7	1 15/16		4.20*
6 3/4	8	1 15/16		4.45*
7 1/2	9	2 5/16		4.70*
8 1/4	10	2 5/16		5.00*
9 1/4	11	2 7/16		5.30*
10 1/4	12	2 7/16		5.60*
11 3/4	14	2 15/16		6.20*
12 3/4	15	2 15/16		6.55
13 1/4	16	2 15/16		6.90
14 1/4	17	2 15/16		7.30
15	18	2 15/16		7.65
16 1/2	20	2 15/16		8.45
18 1/2	22	2 15/16		9.20
20 1/4	24	2 15/16		10.00
21	25	2 15/16		10.50
22 1/4	27	2 15/16	B	11.25
23	28	2 15/16		12.00
24	29	2 15/16		12.55
25	30	2 15/16		13.10
25 3/4	31	2 15/16	B	14.00
27 1/2	33	2 15/16		14.80
30	36	2 15/16		17.50
33	40	2 15/16	B	19.00
34 3/4	42	2 15/16		19.50
35 1/2	43	2 15/16		21.00
36 1/2	44	2 15/16		22.00
39 3/4	48	2 15/16		23.50
42 3/4	52	2 15/16	B	25.50
47 1/2	58	2 15/16	B	28.50
49 1/4	60	2 15/16	B	31.00
59 1/2	72	2 15/16	B	41.00

NO. 112

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
8	6	2 7/16		$8.00*
9 1/2	7	2 7/16		9.50*
10	8	2 15/16		10.50*
11 3/4	9	3 7/16		11.50*
13	10	3 7/16		12.50*
14	11	3 15/16		13.50*
16	12	4 7/16		15.00*
17 1/4	13	4 7/16		16.50*
18	14	4 7/16		18.00*
20	15	4 7/16		21.00
22 1/4	17	4 7/16		27.00
23 1/2	18	4 7/16		29.00

NO. 112—Continued

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
25	19	4 7/16		34.00
26 1/4	20	4 7/16		36.50
28 1/2	22	4 7/16	B	38.50
30	23	4 7/16		40.00
31	24	4 7/16	B	41.50
33 1/2	26	4 7/16		44.00
36 1/2	28	4 7/16		46.00
40 1/2	31	4 7/16	B	47.00
42 3/4	33	4 7/16		49.50
48	37	4 7/16		52.00
52	40	4 7/16		60.00
60	46	4 7/16		87.00

NO. 120

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
6	6	1 15/16		$3.60*
7	7	1 15/16		4.00*
8	8	2 3/16		4.40*
9	9	2 7/16		4.80*
10	10	2 15/16		5.25*
11	11	3 7/16		5.65*
12	12	3 7/16		6.05*
13	13	3 7/16		6.45
14	14	3 7/16		6.85
15	15	3 7/16		7.25
16	16	3 7/16		7.65
17	17	3 7/16		8.05
17 3/4	18	3 7/16		8.45
18 3/4	19	3 7/16		8.90
19 3/4	20	3 7/16		9.40
20 3/4	21	3 7/16		9.90
21 3/4	22	3 7/16		10.35
22 3/4	23	3 7/16		10.80
23 1/2	24	3 7/16		11.20
24 3/4	25	3 7/16		11.70
25 3/4	26	3 7/16		12.25
26 3/4	27	3 7/16		12.75
27 3/4	28	3 7/16		13.30
28 3/4	29	3 7/16		13.85
29 1/2	30	3 7/16		14.40
30 1/2	31	3 7/16		15.20
31 1/2	32	3 7/16		16.00
32 1/2	33	3 7/16		16.80
33 1/2	34	3 7/16		17.60
34 1/4	35	3 7/16		18.40
35 1/2	36	3 7/16		19.25
36 1/2	37	3 7/16		20.20
37 1/2	38	3 7/16		21.20
39 1/4	40	3 7/16		23.10
40 1/2	41	3 7/16		24.00
41 1/2	42	3 7/16	B	24.80
43 1/2	44	3 7/16	B	26.50
44 1/2	45	3 7/16		27.35
45 1/4	46	3 7/16	B	28.20
48	49	3 7/16		30.75
54	55	3 7/16		35.75
57	58	3 7/16	B	38.30
66	67	3 7/16	B	46.50
71 3/4	73	3 7/16	B	55.00

NO. 126-D

Use Sprocket List No. 126 Malleable Chain.

NO. 126-DC

Use No. 126-C M. R. Chain Wheels.

NO. 180

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
20 1/2	5	4 7/16	B	$21.00*
24	6	4 7/16		25.00
31 1/2	8	4 15/16		35.00
35 1/2	9	4 15/16		40.00
39 1/4	10	4 15/16		52.00
54 1/2	14	4 15/16	B	75.00

NO. 182 1/2

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
25 3/4	4	4 7/16	B	$28.00
30 3/4	5	4 15/16		35.00
36	6	4 15/16		52.00
41 1/2	7	4 15/16		63.00
47 1/2	8	4 15/16		75.00

NO. 276—Same as No. 180

NO. 433 1/2

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
4 1/2	5	1		$2.75*
5 1/4	6	1 3/16		2.90*
6	7	1 11/16		3.10*
6 3/4	8	1 15/16		3.30*
7 3/4	9	2 3/16		3.50*
8 1/4	10	2 7/16		3.75*
9 1/4	11	2 11/16		4.00*
10 1/4	12	2 15/16		4.30*
11	13	2 15/16		4.60*
12	14	2 15/16		4.90
12 1/2	15	2 15/16		5.20
13 1/2	16	2 15/16		5.55
14 1/2	17	2 15/16		5.90
15 1/4	18	2 15/16		6.25
16 1/2	19	2 15/16		6.60
16 3/4	20	2 15/16		6.95
17 1/2	21	2 15/16		7.30
18 1/2	22	2 15/16		7.65
19 1/4	23	2 15/16		8.00
20 1/2	24	2 15/16		8.35
21	25	2 15/16		8.70
22	26	2 15/16	B	9.05
22 1/2	27	2 15/16		9.40
23 1/2	28	2 15/16		9.75
24 1/4	29	2 15/16		10.10
25 1/2	30	2 15/16		10.45
26 3/4	32	2 15/16		11.15
27 3/4	33	2 15/16		11.55
28 1/2	34	2 15/16	B	11.95
29 1/4	35	2 15/16		12.35
30 1/4	36	2 15/16		12.75
31 1/4	37	2 15/16		13.20
32	38	2 15/16		13.65
32 3/4	39	2 15/16	B	14.10
33 3/4	40	2 15/16		14.60
36	43	2 15/16		16.20
37	44	2 15/16		16.75
37 3/4	45	2 15/16	A	17.30
38 1/2	46	2 15/16		17.85
41 1/4	49	2 15/16		19.50
42	50	2 15/16	B	20.00
48	57	2 15/16		24.25
50 1/4	60	2 15/16	B	26.00
54 1/2	65	2 15/16	B	30.00
60 1/4	72	2 15/16	B	35.00
64 1/2	77	2 15/16		40.00
67	80	2 15/16		42.50

NO. 809

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
15 1/4	5	3 7/16		$12.50
18	6	3 7/16		15.00
23 1/2	8	3 7/16		20.00

NO. 950

Diameter, Inches	No. of Teeth	Largest Bore, Inches at Reg. Price	Kind	Each
3.92	8	1 7/16		$2.00
4.85	10	1 15/16		2.25
5.32	11	1 15/16		2.40
5.79	12	1 15/16		2.60
6.27	13	1 15/16		2.80
6.74	14	2 3/16		3.00
7.21	15	2 3/16		3.25
10.06	21	2 3/16		4.80
13.30	28	2 3/16		5.70
14.44	30	2 3/16		6.10
27.28	57	2 15/16		12.00

NO. 951—Same as No. 126-C

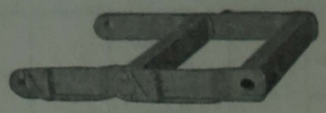
*Use pattern for cast-iron drivers.

Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs, and set screw over keyway.

RIVETED MALLEABLE IRON DRAG CHAINS

Chain is furnished in either plain or attachment links and is especially adapted as a scraper for handling ashes or other similar gritty material in boiler house conduits or trenches. For proper direction to run chain as conveyor see note under sprockets for detachable chain.

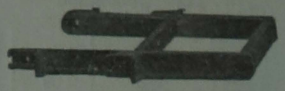
Wing or C Attachment



Plain Chain

Flight or D Attachment

NO. 480-R



NO. 967-R
Fig. 1860

NO. 990-R

Size NOS.	Pitch, Inches	Approx. Weight per Foot, Lbs.	‡Working Strength, Pounds at 150 Feet per Min.	Works Over Sprockets, NOS.	Dimensions in Inches				
					Approx. Over-all Width	Height	Diam., Rivet	Per Foot	Rivets per 100
98-R Plain.....	5	8.2	4200	98-R	7	1½	⅝	$0.98	$8.00
100-R Plain.....	5	8.2	4000	100-R	9	1⅜	9/16	.98	9.50
100-R Flight....	5	9.1	4000	100-R	9	2¾	9/16	1.05	9.50
100-R Wing.....	5	10.6	4200	98-R	12	1½	⅝	1.28	9.50
102-R Plain.....	5	9.1	4200	102-R	9	1½	⅝	1.13	10.50
102-R Flight....	5	9.4	4200	102-R	9	2¾	⅝	1.20	10.50
102-R Wing.....	5	10.9	4200	102-R	13¾	1½	⅝	1.35	10.50
104-R Plain.....	6	7.4	4200	104-R	7	1½	⅝	.98	8.00
104-R Flight....	6	...	4200	104-R	7	2⅞	⅝	1.05	8.00
104-R Wing.....	6	9.8	4200	104-R	11¾	1½	⅝	1.20	8.00
110-R Plain.....	6	12.5	4200	110-R	12	1½	⅝	1.50	14.50
110-R Flight....	6	14.1	4200	110-R	12	2⅞	⅝	1.73	14.50
110-R Wing.....	6	14.5	4200	110-R	17½	1½	⅝	1.80	14.50
110-R N.....	6	...	4200	110-R	12	3⅜	⅝	1.65	14.50
112-R Plain*....	8	10.0	4200	112-R	12	1½	⅝	1.35	14.50
112-R C 45.....	8	...	4200	112-R	12	6	⅝	2.78	14.50
112-R Flight....	8	...	4200	112-R	12	3½	⅝	1.50	14.50
112-R N.....	8	...	4200	112-R	12	3½	⅝	1.50	14.50
120-R Plain.....	6	16.0	5000	120-R	12	2	¾	2.55	19.00
120-R Flight....	6	17.7	5000	120-R	12	3¾	¾	2.70	19.00
480-R Plain.....	8	16.2	5000	480-R	16⅛	2	¾	2.25	24.00
967-R Plain.....	6.07	15.2	5000	110-R	12½	1 9/16	¾	1.80	19.00
990-R Plain.....	6.07	18.8	5000	110-R	14 1/16	1 9/16	¾	2.65	50.00
1051-R Plain.....	8.8	...	7500	1051-R	16 1/16	2	⅞	3.20	35.00
1156-R Plain.....	6.0	13.4	5000	1156-R	9¾	1 9/16	¾	1.90	20.00

Bold face type indicates stock numbers. *Preferred size in 8-inch pitch.

‡Working strengths in table are increased or decreased for speeds other than 150 feet per minute. Maximum speeds for all the above chains are 200 feet per minute. Economical speeds in gritty materials not to exceed 100 feet per minute.

CAST-IRON SPROCKET WHEELS

FOR RIVETED MALLEABLE IRON DRAG CHAINS

Prices for chilled rim and steel sprockets and for flanged idlers on application. Always state which are driving and which are driven wheels. If not stated driven wheels will be furnished. "A" stands for driving, "B" for driven wheels. When not indicated both kinds are made.

NOS.	Diameter, Inches	Number of Teeth	Largest Bore at Reg. Price, Inches	Kind	Each	NOS.	Diameter, Inches	Number of Teeth	Largest Bore, at Reg. Price, Inches	Kind	Each
98R	On Application		.....	....	.....	110R	8½	4	2 5/16	B	$10.00
100R	19½	12	2 5/16	B	$19.80	110R	12¼	6	2 5/16	B	13.50
100R	21½	13	2 5/16	B	22.55	110R	15¾	8	2 5/16	B	19.60
102R	11½	7	2 5/16	B	10.45	110R	17¾	9	2 5/16	B	23.75
102R	13¼	8	2 5/16	B	12.10	110R	21¾	11	2 5/16		32.15
102R	16¼	10	2 5/16	B	15.40	112R	18¾	7	2 5/16		23.40
102R	19½	12	2 5/16	B	19.80	112R	21	8	2 5/16		26.45
102R	21	13	2 5/16	B	22.55	120R	On Application				
104R	12	6	2 5/16	B	9.30	480R	...	...	...	....	.....
104R	14	7	2 5/16		10.70	967R	...	...	...	....	.....
104R	15¾	8	2 5/16		12.10	990R	...	...	...	....	.....
104R	18	9	2 5/16	B	13.55	1051R	...	...	...	....	.....
104R	21¼	11	2 5/16	B	16.45	1156R	...	...	...	....	.....
104R	25	13	2 5/16	B	24.00	.....	...	...	...	....	.....

Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs and set screw over keyway.

FLAT AND ROUND STEEL LINK CHAINS

An all-steel welded chain fitted to general elevator and conveyor service for non-gritty, partially protected dry semi-gritty, or wet, semi-gritty materials. Can be used to advantage, where corrosion has given trouble in the use of riveted chains. Has broad wearing surfaces and repairs when needed can be made by any mechanic.

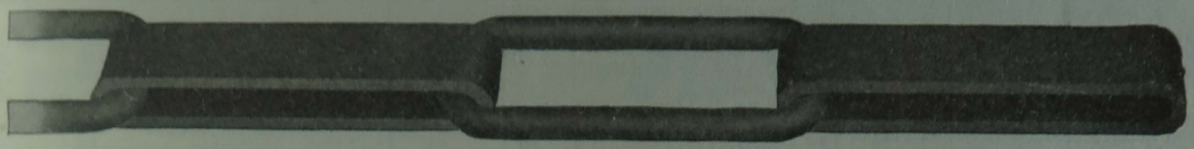


Fig. 1861
Standard Link

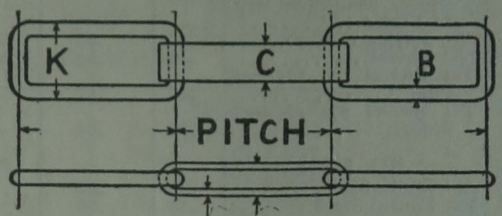


Fig. 1862

Chain NOS.	Pitch, Inches	Dimensions, Inches					Maximum Speed Per Minimum Feet	Weight Strength at 150 ft. Per Minimum Lbs.	Approx. Weight Per Ft., Lbs.	Per Foot
		B	C	D	K	R				
504½	4.0	½	1¼	¼	2½	1⅛	250	2475	2.40	$1.30
506	6.0	½	1¼	¼	2½	1⅛	250	2475	2.10	1.90
516	6.0	⅝	1⅜	⅜	3	1½	250	3400	3.45	1.10
516½	6.0	¾	1¾	⅜	3 9/16	1⅝	250	5225	4.66	1.50
518	8.0	¾	1¾	⅜	3 9/16	1⅝	200	5225	4.49	1.25
520	8.0	⅞	2	½	4 1/16	2	200	6900	6.82	1.90
521	10.0	1	2½	½	4⅞	2⅛	150	9800	8.40	2.10

Working Strengths in Tables are increased or decreased for speeds other than 150 feet per minute. Use but half of working values thus obtained for service in abrasive materials.

Economical speeds about .8 of maximum speeds listed.

ATTACHMENTS FOR FLAT AND ROUND STEEL LINK CHAINS

STANDARD STOCK ATTACHMENTS

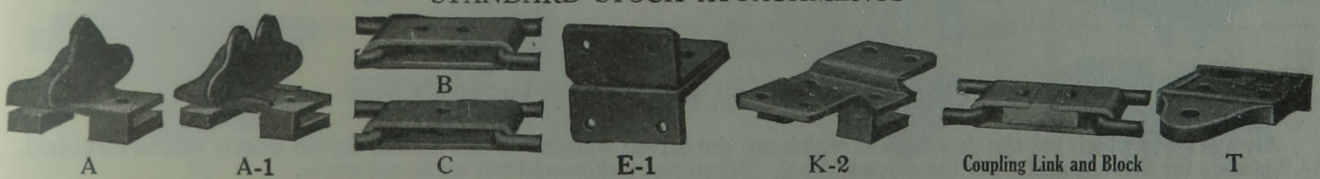
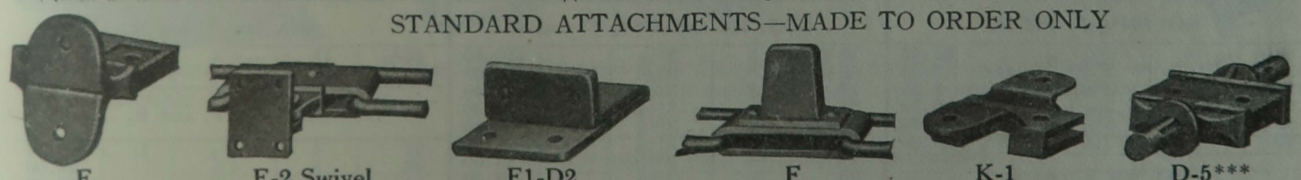


Fig. 1863

*Made from T and M-1 as shown.
†Made from T with T-1-2.
‡M-1 Special Swivel is made from T Spec. and M-1 Spec.
††T-1 Female half plus T-2 Male half equals T1-2 as shown.

STANDARD ATTACHMENTS—MADE TO ORDER ONLY



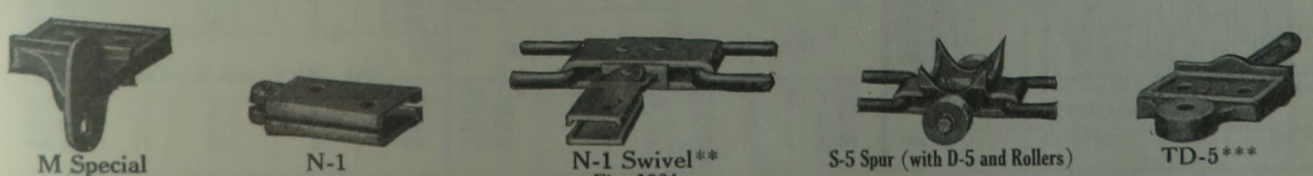


Fig. 1864

**Made from T and N-1. ***Two Rollers on D-5 and one roller on TD-5 included in Price List.
The TD-5 attachments will take the M-1 Spec. attachments.

ATTACHMENTS FOR FLAT AND ROUND STEEL LINK CHAINS

Attachment NOS.	Loose Each	Assembled In Chains Each
NO. 504½		
A Malleable	$0.25	$0.35
K-2 Malleable	.30	.40
S-4 Forged Steel	.55	.70
NO. 506		
A Malleable	.29	.39
E-1 Forged Steel	.30	.42
K-2 Malleable	.30	.40
M Spec. Malleable	.25	.35
M-1 Malleable Wing Only	.12	....
N-1 Malleable Wing Only	.25	....
S-4 Forged Steel	.60	.75
T Malleable	.15	.27
T-1, T-2 for 1¼-inch Pipe	.25	....
T D-5 Malleable	.21	.35
Mall. Roller Link with Roller	.50	.90
M-1 Swivel	.30	.42
N-1 Swivel	.35	.47
T-1 Swivel for 1¼-inch Pipe	.40	.52
NO. 516		
A Malleable	.40	.50
E-1 Forged Steel	.35	.50
E-1, D-2 Forged Steel	.40	.55
E-2 Malleable Wing Only	.20	....
F Cast Steel	1.15	1.45
F Malleable	.75	1.05
K-2 Malleable	.40	.52
M Spec. Malleable	.30	.40
M-1 Malleable Wing Only	.18	....
M-1 Sp. No. 1 Mal. Wing (light)	.18	....
M-1 Sp. No. 2 Mal. Wing (heavy)	.20	....
N-1 Malleable Wing Only	.25	....
S-4 Forged Steel	.70	.85
NO. 516—Continued.		
T Malleable	$0.18	$0.32
T Spec. Malleable	.18	.32
T-1, T-2 for 1¼-inch Pipe, 1½-inch Pipe—32c	.25	....
T D-5 Malleable	.25	.40
E-2 Swivel	.40	.55
M-1 Swivel	.40	.55
M-1 Special Swivel No. 1 Wing	.40	.55
T Spec. Malleable with M-1 Spec.	....	....
No. 2 Wing (heavy)	.40	.55
N-1 Swivel	.40	.55
T-1 Swivel for 1¼-inch Pipe	.43	.57
T-1 Swivel for 1½-inch Pipe	.50	.64
NO. 516½		
A-1 Malleable	.67	.80
E-1 Forged Steel	.40	.60
E-1, D-2 Forged Steel	.45	.65
E-2 Malleable Wing Only	.35	....
K-2 Malleable	.55	.70
K-2 Spec. Malleable	.50	.75
M-1 Malleable Wing Only	.18	....
M-1 Spec. Malleable Wing	.20	....
S-4 Forged Steel	.80	1.00
T Malleable	.30	.48
T-1, T-2 for 1½-inch Pipe	.32	....
T D-5 Malleable	.33	.50
E-2 Swivel	.70	.90
M-1 Swivel	.55	.75
M-1 Special Swivel*	.58	.77
T-1 Swivel for 1½-inch Pipe	.62	.80
M Spec. (Use No. 516)	.35	.50
NO. 518		
A-1 Malleable	$0.67	$0.80
E-1 Forged Steel	.40	.65
E-1 Heavy Forged Steel	.50	.75
E-1, D-2 Forged Steel	.55	.75
E-2 Malleable Wing Only	.35	....
K-2 Malleable	.55	.70
K-2 Spec. Malleable	.50	.75
M-1 Malleable Wing Only	.18	....
M-1 Spec. Mall. Wing Only	.20	....
S-4 Forged Steel	.90	1.20
S-5 Spur with D-5 and Rollers	6.00	6.30
T Malleable	.30	.48
T-1, T-2 for 1½-inch Pipe	.32	....
E-2 Swivel	.70	.90
M-1 Swivel	.55	.75
M-1 Special Swivel*	.58	.77
T-1 Swivel for 1½-inch Pipe	.62	.80
NO. 520		
A-1 Malleable	.80	1.00
E-1 Forged Steel	.60	1.00
E-1, D-2 Forged Steel	.60	1.10
K-2 Malleable	.80	1.00
S-4 Forged Steel	.95	1.30
S-5 Spur with D-5 and Rollers	8.35	8.50
NO. 521		
E-1 Heavy-Forged Steel	.85	1.30
E-1, D-2 Forged Steel	.85	1.30
M-1 Malleable Wing Only	.40	....
M-1 Spec. Mall. Wing Only	.55	....
S-4 Forged Steel	1.50	1.90
S-5 Carrier with Roller	8.25	9.00
T Spec. Malleable	.55	.80
M-1 Special Swivel	1.20	1.45

*Made from T with washers and not T Special.

COUPLING LINKS AND BLOCKS

Chain NOS.	504½	506	516	516½	518	520	521
Block only, each	$0.16	.16	.18	.20	.20	.35	.60
Coupling link and block, each	$0.30	.30	.45	.64	68	1.15	2.10

CAST-IRON SPROCKET WHEELS

Always state which are the driving and which are the driven wheels. If not stated, driven wheels will be furnished. "A" stands for driving and "B" for driven wheel. When not indicated both kinds are made.

Prices for chilled rims, steel sprockets and flanged idlers quoted upon application.

Diam. Inches	No. Teeth — One Tooth for every 2 Pitches	Largest Bore at Reg. Price	Kind	Each
NO. 504½ F. and R.				
10½	4	2 7/16		$3.75
13¼	5	2 7/16	B	5.00
18½	7	2 15/16	A	8.50
20¾	8	3 7/16		9.50
23¼	9	3 7/16	B	11.50
36	14	3 7/16	B	18.00
NO. 506 F. and R.				
12	3	2 7/16		$7.00*
15½	4	2 7/16		8.00*
19¾	5	2 15/16		9.50*
23½	6	2 15/16		12.00
27	7	2 15/16		15.00
NOS. 516 and 516½ F. and R.				
16	4	2 15/16		$9.00
19¼	5	2 15/16		$10.50
23¼	6	3 7/16		16.00
27¼	7	3 7/16		17.50
31	8	3 15/16		19.00
34¾	9	3 15/16		22.00
38¾	10	3 15/16		26.00
42½	11	3 15/16		32.00
46	12	3 15/16		42.00
58	15	3 15/16		47.00
NOS. 518 F. and R.—Continued				
21	4	3 15/16	B	$17.00
26	5	3 15/16		20.00
31¼	6	4 7/16		23.00
36½	7	4 7/16		32.00
NO. 518 F. and R.				
56¾	11	4 7/16		$70.00
72	14	4 5/16		140.00
NO. 520 F. and R.				
21	4	4 7/16	B	$20.00
26	5	4 7/16		24.00
31¼	6	4 15/16		35.00
36½	7	4 15/16		42.00
46½	9	4 15/16		62.00
NO. 521 F. and R.—Continued				
26¼	4	4 7/16		$30.00
32½	5	4 7/16	B	42.00
39	6	4 7/16	B	55.00

*Plate center wheels; all others have arms.

Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs and set screws over keyway.

LONG LINK COIL CHAINS

Used extensively in the logging and lumber industries. Also used in handling of slimes or other wet semi-gritty material. Material cannot lodge in the joints of the chain. Repairs can readily be made by any blacksmith.

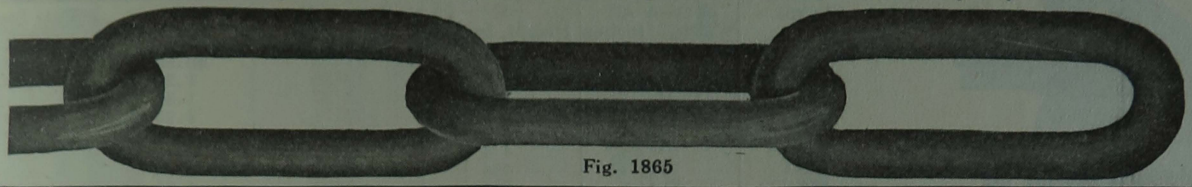


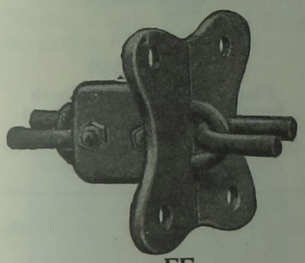
Fig. 1865

Chain NOS.	Working Strength Lbs. 150 Ft. per Min.	Max.† Speed Ft. per Min.	Dimensions in Inches			Per Foot	Chain NOS.	Working Strength Lbs. 150 Ft. per Min.	Max.† Speed Ft. per Min.	Dimensions in Inches			Per Foot
			Stock Diam.	Inside Length	Inside Width					Stock Diam.	Inside Length	Inside Width	
482	4500	175	1	8	2	$0.90	547	4000	225	7/8	5	1 1/2	$0.76
483	9400	150	1 3/8	8	2 1/2	.....	676	1960	225	5/8	5	1 1/8	.43
530	1380	250	1/2	4	13/16	.35	677	3425	225	7/8	6	1 3/4	.73
531	2200	225	5/8	5	1	.40	891	5120	175	1	8	1 3/4	.87
532	3375	225	3/4	6	1 1/8	.50	892	16820	150	1 3/4	10	2 5/8	....
533	4820	200	7/8	7	1 1/4	.63	896	3030	225	3/4	6	1 1/4	.52
534	5120	175	1	7	1 3/4	.90	907	7300	175	1 1/8	7	1 3/4	....
535	6400	175	1 1/8	8	2	....	916	4000	225	7/8	6	1 1/2	.70
536	7800	175	1 1/4	8	2 1/4	....	917	4800	225	7/8	5	1 1/4	.72
538	13600	150	1 1/2	8	2 1/4	....	918	1125	225	1/2	5	1	.35
539	4375	225	7/8	5	1 3/8	.74	919	1467	225	5/8	6	1 1/2	.40
541	5120	200	1	6	1 3/4	1.00	921	2525	225	3/4	6	1 1/2	.54
541 1/2	6000	200	1	6	1 1/2	.98	925	6000	175	1	7	1 1/2	.90
542	4820	225	7/8	6	1 1/4	.68	927	1380	275	1/2	3 1/2	13/16	.40
544	3375	225	3/4	5	1 1/8	.56							

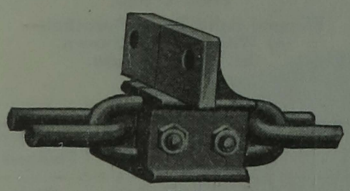
Working strengths are increased or decreased for speeds other than 150 feet per minute. Use half of values thus obtained for service in abrasive gritty materials.

†For economy speeds should not be in excess of 75 per cent of maximum speeds.

ATTACHMENTS FOR LONG LINK COIL CHAINS



FF



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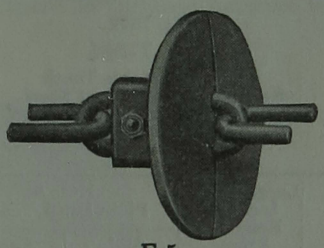

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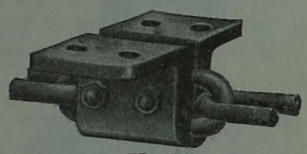
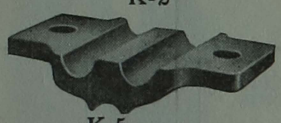
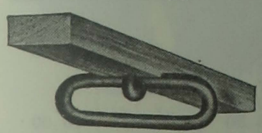


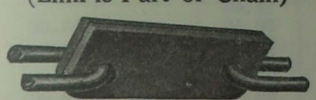
K-2**



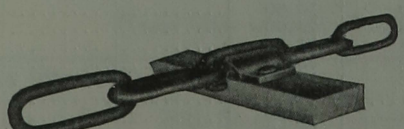
K-5



U-Bolt with Plate Washer
(Link is Part of Chain)

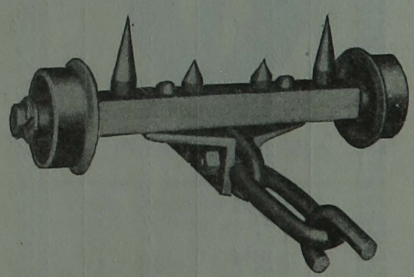


S-2½ Square Spur
(Double Plate)



The K-5 Attachment shown above is bolted up under wood cross-bar

Fig. 1866



Steel spiked heavy axles with rollers give excellent service in handling very large and medium size logs

Chain NOS.	Each complete with bolts where illustrated								
	FF	F 2	F-5 6-Inch Diam.	K-1	K-2	K-5	U-Bolt with Plate Washer	S-2½ Square Spur†	Spiked Log Spur with Rollers
530	*	*	....	$0.34	$0.40	$0.25	$0.20	*	....
531	*	*	*	.....	.50	.40	.25	*	....
532	*	*	*	.....	.80	.45	.27	*	*
533	....	*	....	.....	1.00	.50	.35	....	....
534	....	....	....	.....	....	....	.45	....	....

*Prices upon application. †Designed upon application for all sizes of chains. **K-1 has two holes.

ATTACHMENTS FOR LONG LINK COIL CHAINS

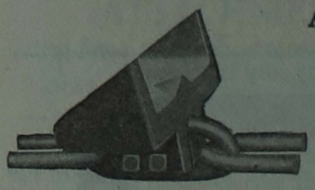


Fig. 1867
NO. S-1½ Log Spur

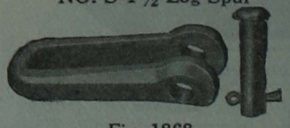


Fig. 1868
Standard Coupling Link and Pin

NO. S1½ Attachment, Complete with Filler Blocks and Bolts

Chain NOS.	A Over-All Width,‡ Inches	E Height, Inches	Pattern No. of Spur	Cast Iron Each	Cast Steel Each
530	7¾	2¾	17473	$0.85	$2.30
531	8¼	3¼	18726	1.25	3.40
532	9	3⅝	18727	1.85	4.80
532	11	5	24174	2.25	5.90
533	9½	4	18728	2.35	6.00
534	10	4¼	17211	3.15	7.00
535	10½	4⅝	18729	3.75	8.30
536	11¼	5⅛	18730	4.30	9.80
538	12¾	5⅞	18731	6.00	13.60
541	10	4¼	17211	3.15	7.00

‡Spurs of the dimensions listed have proved in service to be well proportioned to size of stock in chains. Spurs of other dimensions, however, will be designed for special requirements.

Malleable Iron Standard Coupling Links with Cottered Pins

Chain NOS.	Each	Chain NOS.	Each
530	$0.30	533	$1.00
531	.50	534	1.25
532	.75	535	2.00

"Cold Shut" and "Steel Forged" Coupling for all sizes of Coil Chains.
Prices on Application

Fig. 1869
Cold Shut Steel Coupling Link

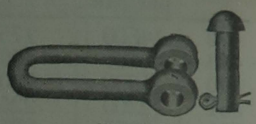


Fig. 1870
Steel Forged Coupling Link and Pin

CAST-IRON SPROCKET WHEELS FOR LONG LINK COIL CHAINS

For best service use solid teeth for short conveyors of ordinary duty. Adjustable teeth for long conveyors or Heavy duty. Gaps in adjustable tooth sprockets allow for clearing such attachments or parts as may extend below the chain as it rides over the wheel.

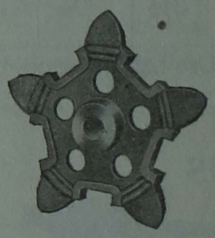


Fig. 1871
NO. T-543
Plain Solid Tooth Sprocket—
(a) With Gaps as Shown.
(b) Without Gaps.

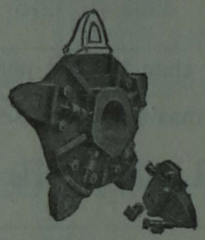


Fig. 1872
NO. T-544
Plain Adjustable Tooth Sprocket—Teeth Cast Steel.
(a) With Gaps. (b) Without Gaps as Shown.

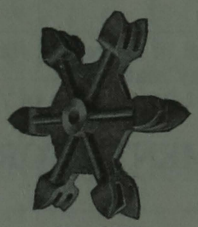


Fig. 1873
NO. T-545
Flanged Solid Tooth Sprocket—
(a) With Gaps as Shown.
(b) Without Gaps.

Fig. 1874
NO. T-546
Flanged Adjustable Tooth Sprocket—Teeth Cast Steel.
(a) With Gaps as Shown.
(b) Without Gaps. (c) With or Without Gaps as Ordered.

Chain NOS.	Diameter, Inches	No. of Teeth	Largest Bore, Inches, Regular Price	NO. 543, Plain Solid Tooth		NO. 544, Plain Adj. Tooth		NO. 545, Flanged Solid Tooth		NO. 546, Flanged Adj. Tooth	
				Style	Each	Style	Each**	Style	Each	Style	Each**
530	13	5	2 7/16	c	$6.00			a	$7.20		
530	15¾	6	2 15/16	c	7.50	b	$30.00	a	9.00	b	$33.00
530	20½	8	3 7/16	a	10.00	a	35.00	c	12.00	c	36.00
530	23½	9	3 7/16	b	12.00	.....	.....	a	14.40	.....	.....
531	13	4	2 7/16	b	6.00	.....	.....	a	7.20	.....	.....
531	16¼	5	2 7/16	c	9.00	.....	.....	a	10.80	.....	.....
531	19½	6	2 15/16	†a	14.00	b	39.75	*a	16.80	c	46.00
531	22½	7	2 15/16	b	15.00	.....	.....	a	18.00	.....	.....
531	25¼	8	3 7/16	*a	19.00	.....	.....	a	22.80	.....	.....
531	29¼	9	3 7/16	a	24.00	.....	.....	a	28.80	.....	.....
532	19½	5	2 15/16	c	13.00	.....	.....	a	15.60	.....	.....
532	23½	6	3 7/16	c	17.00	b	49.50	*a	20.40	b	64.00
532	27	7	3 7/16	.....	.....	.....	.....	a	28.50	.....	.....
532	31	8	3 7/16	*a	30.00	.....	.....	a	36.00	.....	.....
533	18½	4	2 15/16	†b	17.00	.....	.....	b	20.40	.....	.....
533	23	5	3 7/16	a	19.00	b	54.00	a	22.80	c	70.00
533	31¾	7	3 15/16	*a	32.00	.....	.....	.....	.....	.....	.....
534	23¾	5	3 7/16	*c	24.00	b	57.00	a	28.80	c	75.00
534	31¾	7	3 15/16	b	31.00	.....	.....	†a	37.20	.....	.....
535	26½	5	4 7/16	.....	.....	b	80.00	c	37.20	b	94.00
535	31½	6	4 7/16	.....	.....	b	105.00	.....	.....	b	120.00
536	26½	5	4 7/16	b	33.00	b	90.00	b	39.60	b	100.00
538	26½	5	4 7/16	.....	.....	b	100.00	.....	.....	.....	.....
541	19⅞	5	3 15/16	.....	.....	.....	.....	.....	.....	b	52.00
542	23½	6	3 15/16	.....	.....	.....	.....	a	24.00	b	66.00
543	16	5	2 7/16	.....	.....	.....	.....	a	17.00	.....	.....
544	19½	6	2 15/16	.....	.....	.....	.....	.....	.....	c	48.00
574	16½	5	2 7/16	.....	.....	.....	.....	b	28.80	.....	.....
547	19½	6	2 15/16	.....	.....	.....	.....	.....	.....	a	50.00
547	25¼	8	3 7/16	*c	31.00	.....	.....	.....	.....	.....	.....
587	24½	5	3 7/16	b	24.00	.....	.....	.....	.....	.....	.....
587	29¼	6	3 15/16	b	31.00	.....	.....	.....	.....	.....	.....
907	23¼	5	3 7/16	*b	31.00	.....	.....	.....	.....	.....	.....
914	24¾	9	3 7/16	b	24.00	.....	.....	.....	.....	.....	.....

*Driver only, †Driven only; all others are driver or driven as ordered.
**Prices of cast steel centers for Nos. T-544 and 546 upon application.
Extra charge for large bores, large hubs, split hubs, facing both hubs, and set screw over keyway listed on previous page.

CAST IRON IDLERS

FOR LONG LINK COIL CHAINS

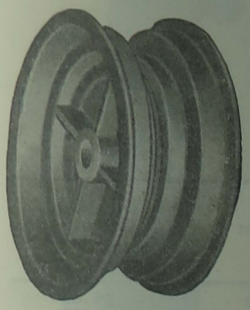


Fig. 1875

Heavy Flanged and Grooved Idler

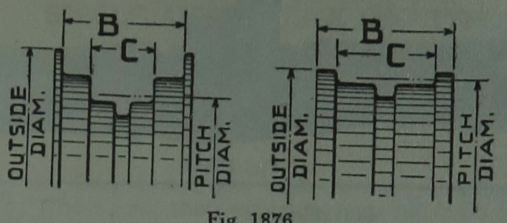


Fig. 1876

In the use of S-1½ Spurs the width "A" of Spurs must be less than dimensions "B" listed below on those Heavy Flanged and Grooved Idlers having Outside Flanges. See note.

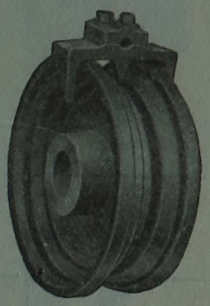


Fig. 1877

Inverted Spur Idler

Heavy Flanged and Grooved Idlers

Chain NOS.	Pitch Diam., Inches	Pattern Nos.	Dimensions, Inches B	Dimensions, Inches C	Outside Diam., Inches	Each
530	16	18993	9	3¾	23½	$15.00
531	16	18994	9⅝	4¼	24⅜	25.00
531	16	13440	9⅞	3⅝	22½	25.00
532	24	18995	10¾	4⅞	33⅜	49.00
*533	24	18996	9½	5¾	29⅛	$53.00
*534	27	18997	10	6⅜	33¼	55.00
*535	27	18998	10½	6¾	34⅜	60.00
*536	27	18999	11¼	7½	35	70.00
*538	27	19000	12¾	8⅛	35¾	122.00

Inverted Spur Idlers

531	17½	14837	6¼	3½	17½	$15.00	534	19½	†	7¼	4⅝	20½	$24.00
532	18½	†	6¼	3¾	20	16.00	535	23	†	8	4¾	24	30.00
532	20	5129	6¾	4	22¾	17.00	536	20	8231	8	5¼	21¼	28.00
532	24	†	6¾	3¾	25½	19.00	536	26	13634	8	5¼	27¼	31.00
533	23	†	5¼	3½	24⅞	19.00	907	19½	†	7¼	4⅝	20½	25.00

*These Idlers have no outside Flanges. Outside Flanges on the other idlers will be stopped off on order. †Order by Name, Chain No. and Pitch Diameter. §Support Inverted Spurs on runways between idlers. This is a preferred construction.

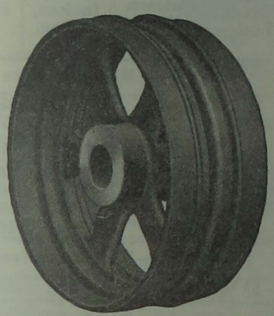


Fig. 1878

Drum Idler with Flanges but without Steel Extensions

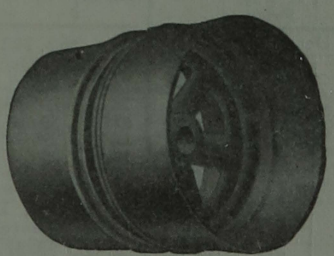


Fig. 1879

Drum Idler with Steel Extensions

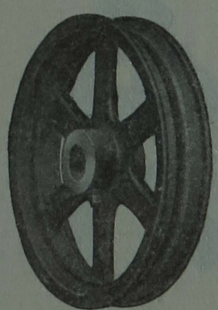


Fig. 1880

Plain Grooved Idler

Drum Idlers							Plain Grooved Idler‡		
	Without Steel Extensions			With Steel Extensions					
Chain NOS.	Pitch Diameter, Inches	Face, Inches	Each	Pitch Diameter, Inches	Face, Inches	Each	Chain NOS.	Pitch, Diameter, Inches	Each
530	12	5¾	$7.50	12	12 to 16	$15.00	530	12	$7.00
530	16	6	9.50	16	16 to 20	19.00	530	16	8.00
531	16	6½	11.00	16	16 to 20	20.00	531	14	7.50
531	19	6½	13.50	19	20 to 24	27.00	531	20	11.00
531	20	6	14.50	20	20 to 24	32.00	532	20	17.00
532	20	8	18.50	20	20 to 24	35.00	534	24	23.80
532	24	8	23.50	24	20 to 24	45.00	...	..	.....
533	20½	8	25.50	20½	20 to 24	43.00	...	..	.....
533	24	9½	30.00	24	20 to 24	47.00	...	..	.....
534	24	9¼	32.00	24	20 to 24	52.00	...	..	.....

‡Plain Grooved Idlers are used for the support of plain chains or chains with U-Bolts and Cross-bars, where the cross-bars rest in trough or on outside supports.

MALLEABLE ROLLER LOG HAUL-UP CHAINS

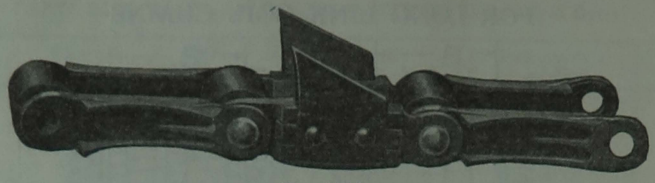


Fig. 1881

Chain NOS.	‡Working Strength, Lbs. at 150 Feet per Min.	Malleable Iron		Steel Pin Inches	Per Foot Plain	Per Foot Spur Every Link
		Pitch of Chain, Inches	Over-all Width of Chain, Inches	Size of Pin		
6	6000	8	5	7/8	$2.65	$4.65
6C	6000	8	5	7/8	2.85	4.85

CAST IRON SPROCKET WHEELS

FOR MALLEABLE ROLLER LOG HAUL-UP CHAINS

Prices for chilled rim and steel sprockets, and for flanged idlers on application. Always state which are driving and which are the driven wheels. If not stated driven wheels will be supplied. "A" stands for driving, "B" for driven wheels. When not indicated both kinds are made.

Chain NO. 6					Chain NO. 6C—3-Inch Roller				
Diameter, Inches	No. of Teeth	Largest Bore, Inches, at Reg. Price	Kind	Each	Diameter, Inches	No. of Teeth	Largest Bore, Inches, at Reg. Price	Kind	Each
13 3/4	5	2 15/16	A	$13.00	16	6	3 7/16	B	$14.50*
15 3/4	6	3 7/16		14.50	18 1/2	7	3 15/16	B	16.00*
21 1/4	8	3 15/16		23.00	21	8	3 15/16		23.00*
23 1/2	9	3 15/16	B	27.00	26	10	4 7/16		29.00
36 1/2	14	4 7/16	A	41.00	36 1/4	14	4 7/16	A	41.00

*Plate center wheels; all others have arms.

Note.—Extra charge for large bores, large hubs, split hubs, facing both hubs and set screw over keyway.

CAST-IRON CHILLED RIM TRACTION WHEELS

FOR DETACHABLE LINK, RIVETED DRIVE, SQUARE SHANK PIN AND STEEL BUSHED COMBINATION CHAINS

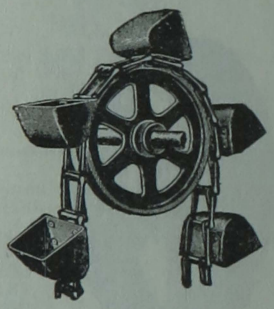


Fig. 1882

No. T-554

Actual Diam., Inches	Pattern Nos.	Largest Bore, Inches, at Reg. Price	Each
NOS. 57, 67, 77 Detachable			
9 1/4	29720	2 7/16	$4.30
12	29718	2 15/16	6.00
13 1/4	29781	2 15/16	6.00
19 1/2	29724	2 15/16	9.00
23 1/2	29744	3 7/16	15.50
NO. 66 Detachable			
9 1/4	29720	2 7/16	$4.30
13 1/4	29781	2 15/16	6.00
19 1/2	29724	2 15/16	9.00
NOS. 75, 78, 88 Detachable			
9 1/4	29715	2 11/16	$5.30
12	29718	2 15/16	6.00
13 1/4	29773	2 15/16	7.25
15 1/8	29777	2 15/16	7.50
19 1/2	29724	2 15/16	9.00
23 1/2	29735	2 15/16	10.00
29 1/4	29741	2 15/16	12.75
NO. 83 Detachable			
13 1/4	29781	2 15/16	$6.00
23	29734	2 15/16	10.00
NOS. 85, 95 Detachable			
11	29780	2 15/16	$6.80
13 1/8	29776	2 15/16	7.30
15	29771	2 15/16	8.50
16 1/8	29768	2 15/16	9.00
18 1/4	29788	2 15/16	9.50
20 1/4	29732	2 15/16	11.00
23 1/4	29762	2 15/16	12.40
24 1/2	29787	2 15/16	14.00
30 5/8	29739	2 15/16	17.00
35 1/2	29736	2 15/16	21.25
NOS. 103, 114, 124 Detachable			
9 1/4	29715	2 11/16	$5.30
12	29718	2 15/16	6.00
13 1/4	29773	2 15/16	7.25
19	29725	2 15/16	10.00
20 1/4	29748	3 7/16	12.00
22 3/4	29743	3 7/16	15.00
23 1/2	29744	3 7/16	15.50
29 5/8	29740	3 7/16	20.00
NO. 104 1/2 Detachable			
11 1/8	29779	2 15/16	$6.50
19	29725	2 15/16	10.00
20 1/4	29748	3 7/16	12.00
NO. 108 Detachable			
8 1/4	29721	2 15/16	$5.30
11	29716	2 15/16	6.80
14	29723	3 7/16	8.30
16 1/4	29772	3 7/16	9.25
18	29770	3 7/16	10.50
20	29729	3 7/16	12.00
21 3/4	29753	3 7/16	13.00
23	29761	3 7/16	14.00
24 1/4	29751	3 7/16	15.00
25	29752	3 7/16	15.50
29	29754	2 7/16	18.50
32	29790	3 7/16	21.50
34 3/8	29737	3 7/16	23.50
NO. 122 Detachable			
10 1/2	29722	2 7/16	$6.50
14 1/8	29782	2 15/16	8.80
18 3/8	29730	3 7/16	13.00
20 3/8	29745	3 7/16	14.60
26 5/8	29756	3 7/16	21.00
28 7/8	29746	3 7/16	23.00
30 1/2	29767	3 7/16	24.00
NOS. 102, 102 3/4, 102-B, 110 Square Shank Pin			
20 3/8	29727	2 15/16	$11.00
21 1/4	29728	2 15/16	11.00
24 1/4	29712	2 15/16	13.00
28	29766	2 15/16	15.25
30 1/8	29755	2 15/16	16.50
NO. 111—Square Shank Pin			
21 1/2	60271	3 7/16	$13.00
28 1/2	60255	3 7/16	18.00
NO. 131—Square Shank Pin			
9 1/4	29715	2 11/16	$5.30
12	29718	2 15/16	6.00
13 1/4	29773	2 15/16	7.25
34 5/8	28565	3 7/16	22.00
NO. 132—Square Shank Pin			
20 3/4	60374	3 7/16	$14.60
22 1/2	60375	3 7/16	16.50
29 1/2	60376	3 7/16	23.00
33 3/4	60377	3 7/16	27.80
NO. 214—Square Shank Pin			
11 1/2	29717	2 15/16	$5.50
13 1/4	29773	2 15/16	7.25
NOS. 73, 78—Riveted Drive			
13 1/4	29781	2 15/16	$6.00
NO. 74 Riveted Drive			
9 1/4	29720	2 7/16	$4.30
28 5/8	29763	2 15/16	12.40
NO. 75—Riveted Drive			
19 1/2	29724	2 15/16	$9.00
NO. 82—Riveted Drive			
9 1/4	29715	2 11/16	$5.30
12	29718	2 15/16	6.00
13 1/4	29773	2 15/16	7.25
22 3/4	29743	3 7/16	15.00
NO. 87—Riveted Drive			
11 1/8	29779	2 15/16	$6.50
NO. 95—Riveted Drive			
21 1/4	29728	2 15/16	$11.00
24 1/4	29712	2 15/16	13.00
28	29766	2 15/16	15.25
30 1/8	29755	2 15/16	16.50
NO. 104—Riveted Drive			
13 1/2	60058	2 15/16	$7.50
NO. 823—Steel Bushed Combinations			
9 1/4	29715	2 11/16	$5.30
11 1/2	29717	2 15/16	5.50
12	29718	2 15/16	6.00
13 1/4	29773	2 15/16	7.25
NO. 825—Steel Bushed Combinations			
20 1/4	29748	3 7/16	$12.00
NO. 847—Steel Bushed Combinations			
23	60068	4 15/16	$32.00
NO. 844—Steel Bushed Combinations			
22 1/2	60271	3 15/16	$20.00
28 1/2	60255	3 15/16	26.00

Note.—Extra charges for large bores, large hubs, split hubs, facing both hubs and set screws over keyway.

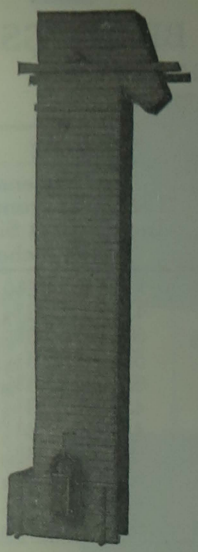


Fig. 1883
NO. T-556

ELEVATOR CASINGS

SINGLE AND DOUBLE LEG TYPES

Wood Casings are substantially built of well seasoned and well selected tongue and grooved lumber and are made in lengths of sections which can be readily handled and assembled into place.

Steel Plate Casings are also built in easily handled sections and by men whose long shop experience in this class of work is an assurance of that clean and clear cut workmanship which pleases. The gauges of steel, size of corner angles and spacing of rivets are such as have been dictated by engineering years of experience as the most economically fitted to the sizes of casings and the nature of their service.

Note on order as to which is required. Casings may be made practically dust tight at a small extra charge, while all casings have the upper half of the head and a side of the lower section bolted on, for the ready inspection of the elevator parts.

Prices on Application

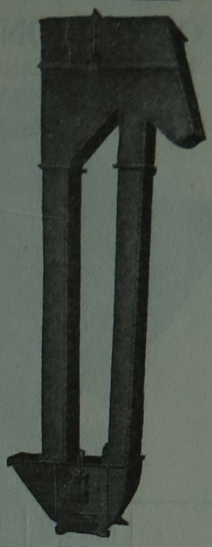


Fig. 1884
NO. T-557

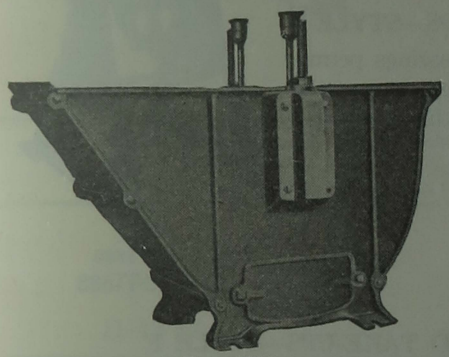


Fig. 1885
NO. T-559

STANDARD CAST IRON ELEVATOR BOOTS

With Adjustable Bearings and Steel Plate Bottoms and steep sloping Receiving Throat to insure flowing materials being readily picked up. It is dust tight and provided with large clean-out doors. As the Leg Seat is perfectly straight, no special carpenter work is needed to fit the elevator leg.

Buckets hung by back to Belt or Chain.‡

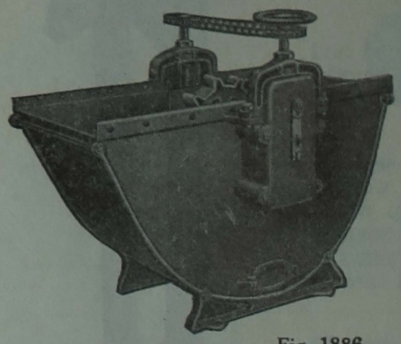
Length and Projection of Bucket, Inches	†Diameter of Pulley or Sprocket, Inches	Diameter of Shaft, Inches	Approx. Weight, Pounds	Each, with Sprocket or Pulley
Boot NO. 111				
3 x3	14	1 3/16	215	$29.75
3 1/2x3	13			
3 1/2x3 1/2	13			
4 x3	14			
4 x3 1/2	13	1 3/16	220	30.00
4 x4	12			
4 1/2x3	14			
4 1/2x3 1/2	13	1 3/16	225	30.25
4 1/2x4	12			
5 x3	14			
5 x3 1/2	13	1 3/16	230	30.60
5 x4	12			
5 1/2x3	14			
5 1/2x3 1/2	13	1 3/16	235	31.00
5 1/2x4	12			
6 x3	14			
6 x3 1/2	13	1 3/16	240	31.50
6 x4	12			
Boot NO. 112				
6 x4 1/2	18			
6 x5	17	1 7/16	335	$38.50
6 x5 1/2	16			
7 x4 1/2	18			
7 x5	17	1 7/16	345	39.50
7 x5 1/2	16			
8 x4 1/2	18			
8 x5	17	1 7/16	360	40.50
8 x5 1/2	16			
Boot NO. 112—Continued				
9x4 1/2	18			
9x5	17	1 7/16	375	$41.50
9x5 1/2	16			
10x5	17	1 7/16	385	42.50
10x5 1/2	16			
Boot NO. 113				
10x6	21			
10x6 1/2	20	1 15/16	625	$61.00
10x7	18			
11x6	21			
11x6 1/2	20	1 15/16	640	62.50
11x7	18			
12x6	21			
12x6 1/2	20	1 15/16	660	64.00
12x7	18			
13x6	21			
13x6 1/2	20	1 15/16	680	65.50
13x7	18			
14x6	21			
14x6 1/2	20	1 15/16	700	67.00
14x7	18			
15x6	21			
15x6 1/2	20	1 15/16	720	68.50
15x7	18			
16x6	21			
16x6 1/2	20	1 15/16	740	71.00
16x7	18			
18x6	21	1 15/16	780	74.00
Boot NO. 113—Continued				
18x6 1/2	20	1 15/16	780	$74.00
18x7	18			
20x6	21			
20x6 1/2	20	1 15/16	820	80.00
20x7	18			
Boot NO. 114				
12x 8	22			
12x 9	20	2 7/16	980	$87.00
12x10	18			
14x 8	22			
14x 9	20	2 7/16	1035	91.00
14x10	18			
16x 8	22			
16x 9	20	2 7/16	1090	94.00
16x10	18			
18x 8	22			
18x 9	20	2 7/16	1145	98.00
18x10	18			
20x 8	22			
20x 9	20	2 7/16	1200	105.00
20x10	18			
22x 8	22			
22x 9	20	2 7/16	1255	109.00
22x10	18			
24x 8	22			
24x 9	20	2 7/16	1310	114.00
24x10	18			

‡Above prices are for boots taking buckets hung between two strands of chains; add 15 per cent. extra to above list prices for boots taking buckets up to eleven inches and 10 per cent. extra on all larger sizes.

†Size of wheels listed permits of 3/4-inch for height of attachment back of buckets to center of chain.

CAST IRON ELEVATOR BOOTS

Designed for Extra Heavy Work with Adjustable Bearings and Steel Plate Bottom



NO. T-560

Fig. 1886
Extra Heavy

Boot NOS.	Length and Protection Buckets, Inches	Diam. Sprocket or Pulley, Inch: Buckets Hung at Back	Diam. Sprocket or Pulley, Inch: Buckets Hung at Ends	Buckets Hung at Back, Each	Buckets Hung at Ends, Each
6	8x5	20	24	$62.00	$67.50
	9x5	20	24	63.50	68.50
	10x6	18	24	64.50	69.50
	11x6	18	24	66.00	71.00
	12x6	18	24	68.50	75.00
	14x6	18	24	71.50	77.50
	16x6	18	24	75.50	81.00
7	12x7	20	28	79.50	87.50
	14x7	20	28	83.50	89.50
	16x7	20	28	87.00	91.50
	18x7	20	28	90.50	94.00
	20x7	20	28	94.50	103.50
	22x7	20	28	98.50	106.50
	24x7	20	28	105.00	110.00
8	12x8	24	30	87.00	101.00
	14x8	24	30	90.00	103.00
	16x8	24	30	94.50	104.50
	18x8	24	30	98.00	106.50
	20x8	24	30	101.50	117.00
	22x8	24	30	105.50	119.00
	24x8	24	30	109.50	124.00
	30x8	24	30	119.00	130.00
9	16x9–10	30	40	138.50	174.00
	18x9–10	30	40	143.50	176.50
	20x9–10	30	40	149.00	181.50
	24x9–10	30	40	159.50	195.00
	30x9–10	30	40	175.00	204.50

Prices include shaft, pulley or sprocket wheel, closed bearings with take-up boxes and collars. Take-ups are connected by chain when desired, without extra charge.

NO. T-561

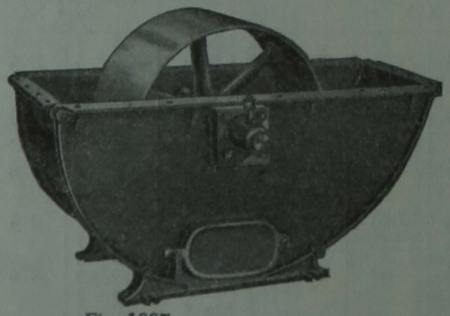


Fig. 1887

Length Bucket, Inches	Each	Length Bucket, Inches	Each
6 to 8	$52.00	16	$64.00
10	55.00	18	67.00
12	58.00	20	71.00
14	61.00	24	78.00

ELEVATOR TAKE-UP BEARINGS

BOOT TAKE-UPS—STYLE A

For Wood Boots

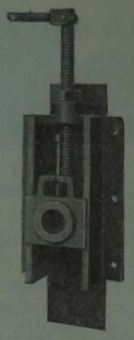


Fig. 1888
NO. T-562

Diameter Shaft, Inches	For Steel Boots, Each	Length, Adjustment, Inches	Bearing: Length Inches	Bearing: Extension from Boot Side, Inches
1 7/16	$5.00	5	2 3/4	2 5/16
1 15/16	6.50	5	4 1/4	2 7/8
2 3/16	7.50	7 1/2	5	3 3/16
2 7/16	9.00	9	5	3 1/4
2 15/16	11.50	12	6	3 9/16
1 7/16	6.00	6	4 1/4	3 1/8
1 11/16	7.00	6	4 1/4	3 1/8
1 15/16	7.50	8	5	3 9/16
2 3/16	8.00	7 1/2	6 3/8	5 3/16
2 7/16	9.50	9	6 3/4	5 3/8
2 15/16	11.50	12	6	4 5/16

HEAD TAKE-UPS—STYLE F

Head take-up bearings permit the driving of an elevator at the foot as well as at the head.

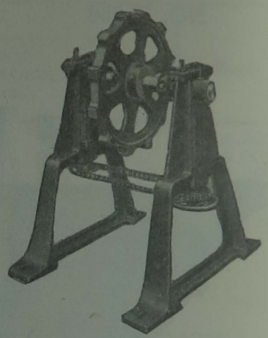


Fig. 1889
NO. T-563

HEAD TAKE-UPS—STYLE F

Dia. Shaft, Ins.	Lgth. Bearings, Ins.	Base to Center of Shaft, Ins.	Vertical Adjustment, Ins.	Base: Width, Ins.	Base: Lgth., Ins.	Distance Between Center of Bearings, Ins.	Per Pair
2 3/16	6 1/2	20 3/8	9 1/2	6	33	30	$30.00
2 7/16	7	20 1/2	9 1/4	6	33	32	31.30
2 11/16	7 1/2	21	10 1/16	6	36	34	34.60
2 15/16	8	21 1/8	9 7/8	6	36	36	37.00
3 3/16	8 1/2	22 1/8	11 1/4	7	39	40	41.00
3 7/16	9	22 3/8	10 3/4	7	39	44	45.60
3 15/16	10	27 7/8	12 1/2	9	37	48	68.80

Price list is per pair of stands complete with bearings and adjustment chain but without shaft, collars, pulley or sprocket.

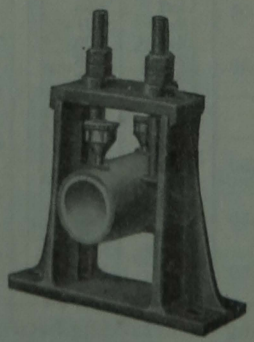


Fig. 1890
NO. T-564

HEAD TAKE-UPS—STYLE G

Designed essentially for heavy duty such as is required in very large or high elevators.

Size Shaft, Inches	Take-Up, Inches	Each
1 15/16	7 1/4	$12.00
2 7/16	6 1/2	15.00
2 15/16	8 9/16	19.00
3 7/16	8	25.00
3 15/16	11 3/4	32.00

STANDARD STEEL ELEVATOR BUCKETS

Front View

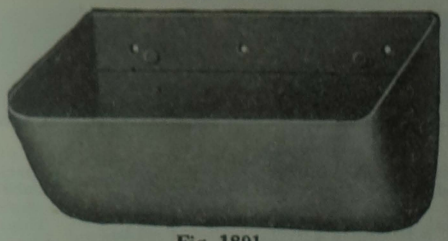


Fig. 1891
T-565

Rear View

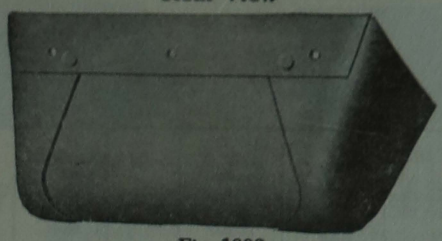


Fig. 1892
T-565A

Rear View

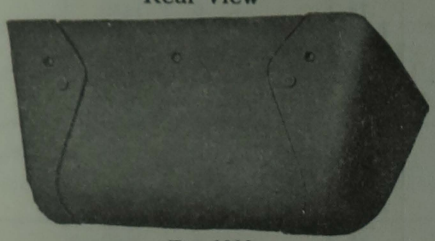


Fig. 1893
T-566

Front View

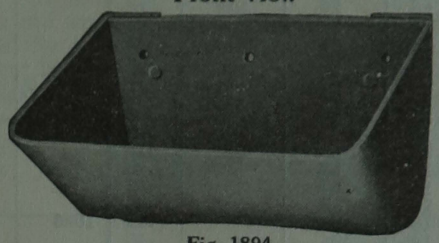


Fig. 1894
T-566A

STANDARD BUCKET PUNCHING FOR BELTS

Width of Buckets, Inches	Number of Holes for ¼-Inch Bolts In One Row	Width of Buckets, Inches	Number of Holes for ¼-Inch Bolts in 2 Rows, Staggered
3–4–5–6	2	14–15–16	3 in Top Row 2 in Bottom Row
7–8–9–10	3	18–20–22	4 in Top Row 2 in Bottom Row
11–12–13	4	24	4 in Top Row 3 in Bottom Row

Holes for chain attachments are placed as best fits the bucket, unless otherwise ordered.
Holes for belts are equally spaced central on the back and near the top of the buckets.

MODIFIED FORMS OF STANDARD STEEL BUCKETS

Digger Edge

Fig. 1895
NO. T-567

Sharp Tooth

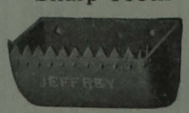


Fig. 1896
NO. T-568

Saw Tooth

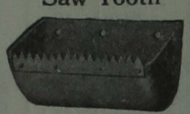


Fig. 1897
NO. T-569

Re-enforced Edge

Fig. 1898
NO. T-570

Low Front

Fig. 1899
NO. T-571

Hooded Back

Fig. 1900
NO. T-572

High Back

Fig. 1901
NO. T-573

Gravity Discharge

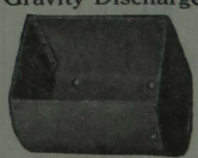


Fig. 1902
NO. T-574

Re-enforced Back

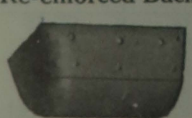


Fig. 1903
NO. T-575

Perforated

Fig. 1904
NO. T-576

Wire Cloth Bucket

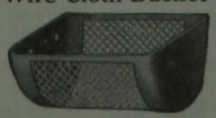


Fig. 1905
NO. T-57

Crib Bucket

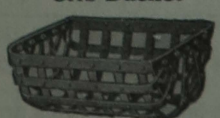


Fig. 1906
NO. T-5778

Prices on Above Buckets Quoted Upon Application

STANDARD STEEL ELEVATOR BUCKETS

(NOS. T-563 and T-564)

Unless otherwise specified, U. S. Gauges of Steel are used in all Standard Buckets

Length by Projection from Belt, Inches	Gauge NOS.	Approx. Weight 100 Buckets, Lbs.	Capacity Bushels per Hour	Each
3 x3	**23**	28	87	$0.10
	16	55		.29
3½x3	**23**	29	102	.10
	16	60		.31
4 x3	**23**	30	116	.15
	16	65		.35
4½x3	**23**	32	131	.15
	16	70		.39
5 x3	**23**	33	145	.18
	16	75		.43
4 x3½	**22**	45	159	.15
	16	82		.38
	14	97		.41
4½x3½	**22**	48	179	.15
	16	90		.40
	14	104		.43
5 x3½	**22**	51	199	.19
	16	97		.44
	14	111		.47
4 x4	**22**	60	183	.22
	16	100		.45
	14	110		.49
	12	150		.67
5 x4	**22**	66	229	.19
	16	116		.48
	14	126		.51
	12	174		.71
5½x4	**22**	69	251	.22
	16	124		.49
	14	134		.53
	12	186		.73
6 x4	**22**	72	274	.22
	16	132		.50
	14	142		.54
	12	198		.75
6 x4½	**20**	95	428	.28
	16	140		.54
	14	167		.58
	12	230		.80
	10	295		.98
7 x4½	**20**	110	500	.30
	16	160		.56
	14	185		.60
	12	256		.83
	10	328		1.03
6 x5	**20**	110	503	.43
	16	168		.55
	14	210		.59
	12	300		.82
	10	380		1.01
	8	467		1.19
	6	550		1.38
7 x5	**20**	125	587	.45
	16	190		.60
	14	230		.65
	12	330		.89
	10	420		1.10
	8	517		1.30
	6	610		1.50
8 x5	**20**	140	670	.38
	16	223		.63
	14	250		.68
	12	360		.93
	10	460		1.15
	8	590		1.36
	6	696		1.56
9 x5	**20**	155	754	.40
	16	245		.75
	14	270		.81
	12	390		1.12
	10	500		1.38
	8	615		1.63
	6	726		1.88
8x6	**18**	240	976	$0.65
	16	300		.73
	14	335		.78
	12	465		1.08
	10	590		1.33
	8	730		1.57
	6	860		1.81
9x6	**18**	255	1098	.68
	16	320		.85
	14	360		.92
	12	500		1.27
	10	630		1.56
	8	790		1.85
	6	930		2.13
10x6	**18**	270	1220	.55
	16	340		.91
	14	385		.98
	12	540		1.36
	10	670		1.67
	8	840		1.98
	6	990		2.28
12x6	**18**	300	1464	.70
	16	380		1.03
	14	435		1.11
	12	600		1.53
	10	750		1.89
	8	940		2.22
	6	1101		2.56
14x6	**18**	340	1708	.80
	16	400		1.05
	14	474		1.13
	12	660		1.56
	10	830		1.93
	8	1040		2.28
	6	1230		2.63
16x6	**18**	380	1952	.90
	16	445		1.10
	14	520		1.19
	12	725		1.64
	10	910		2.02
	8	1145		2.39
	6	1350		2.75
18x6	**18**	420	2196	1.00
	16	490		1.15
	14	580		1.24
	12	785		1.71
	10	1000		2.12
	8	1250		2.50
	6	1480		2.88
20x6	**18**	460	2440	1.10
	16	540		1.20
	14	630		1.30
	12	850		1.79
	10	1100		2.21
	8	1380		2.60
	6	1625		3.00
10x7	**18**	290	1590	.75
	16	356		1.16
	14	444		1.25
	12	605		1.73
	10	785		2.13
	8	980		2.52
	6	1160		2.90
12x7	**18**	320	1908	.90
	16	400		1.28
	14	500		1.38
	12	675		1.90
	10	875		2.35
	8	1100		2.77
	6	1300		3.19
14x7	**18**	372	2226	.95
	16	450		1.30
	14	556		1.40
	12	745		1.94
14x7	**10**	965		$2.39
	8	1220		2.82
	6	1440		3.25
16x7	**18**	416	2544	1.28
	16	500		1.35
	14	612		1.46
	12	815		2.01
	10	1055		2.48
	8	1340		2.93
	6	1580		3.38
18x7	**18**	460	2862	1.38
	16	550		1.40
	14	668		1.51
	12	885		2.09
	10	1145		2.58
	8	1460		3.04
	6	1720		3.50
20x7	18	504	3180	1.43
	16	600		1.45
	14	720		1.57
	12	955		2.16
	10	1235		2.67
	8	1580		3.15
	6	1860		3.63
24x7	**18**	592	3816	1.63
	16	700		1.65
	14	832		1.78
	12	1100		2.46
	10	1415		3.03
	8	1820		3.58
	6	2170		4.13
12x8	18	370	2388	1.20
	16	475		1.53
	14	590		1.65
	12	810		2.27
	10	1025		2.81
	8	1260		3.30
	6	1500		3.81
14x8	18	425	2786	1.30
	16	510		1.55
	14	650		1.67
	12	890		2.31
	10	1125		2.85
	8	1390		3.36
	6	1650		3.88
16x8	**18**	475	3184	1.40
	16	570		1.60
	14	710		1.73
	12	970		2.38
	10	1225		2.94
	8	1520		3.47
	6	1800		4.00
18x8	**18**	525	3582	1.50
	16	630		1.65
	14	770		1.78
	12	1050		2.46
	10	1325		3.03
	8	1650		3.57
	6	1950		4.13
20x8	**18**	575	3980	1.65
	16	690		1.70
	14	830		1.84
	12	1130		2.53
	10	1425		3.13
	8	1790		3.69
	6	2100		4.25
24x8	**18**	675	4776	1.85
	16	810		1.90
	14	950		2.05
	12	1300		2.83
	10	1650		3.50
	8	2050		4.12
	6	2400		4.75

Stock sizes are indicated by bold face figures in the size columns.

The above listed capacities are per hour with backs spaced 12 inches apart and traveling 200 feet per minute. A good engineering practise is to place buckets about three projections apart and not less than 12 inches apart for any size bucket.

MALLEABLE IRON BUCKETS

Fig. 1907
NO. T-579
Style A

The standard bucket in most general use.

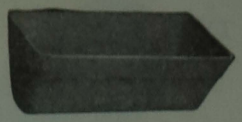


Fig. 1908
NO. T-580
Style AA

When handling gritty materials the life of the bucket is prolonged by the heavily reinforced front edge and corners.

Fig. 1909
NO. T-581
Style B

Most advantageously used when elevator is on an incline and handling coarse materials.

Fig. 1910
NO. T-582
Style C

Handles satisfactorily such materials as tend to stick and pack as clay, pulverized, wet ores, sugar, etc.

These buckets of superior quality, approved pattern and weight, are smooth, seamless and strong, and afford a perfectly clean delivery of the material. They are especially adapted for handling ores, stone, phosphates, cement, coal and other gritty and abrasive materials. In ordering state whether buckets are to be punched for flat belt or for chain, and if for the latter give size and number of strands of chain and style of attachments.

Size of Bucket, Inches	Capacity, Cubic Feet	Approx. Weight, Lbs.	Each
Style A			
4 x 2¾x 3	.009	¾	$0.31
4½x 3 x 3½	.012	⅞	.38
5 x 3½x 3¾	.02	1½	.43
6 x 4 x 4¼	.023	2¼	.55
7 x 4½x 5	.047	3½	.76
8 x 5 x 5½	.065	4¼	.90
8 x 6 x 4½	....	5¼	1.10
10 x 6 x 6¼	.110	6⅝	1.45
10 x 7 x 5⅝	....	....	1.60
11 x 6 x 6¼	.120	7	1.55
12 x 6 x 6¼	.140	7⅞	1.65
12 x 7 x 7¼	.150	9¾	1.90
14 x 7 x 7¼	.250	12	2.20
14 x 8 x 8½	.280	16¾	3.00
15 x 7 x 7¼	.260	13¼	2.35
16 x 7 x 7¼	.270	14	2.60
16 x 8 x 8½	.310	19	3.40
18 x 8 x 8½	.380	18	3.75
18 x10 x10½	.609	30	5.85
Style AA			
6x4x4¼	.023	2½	$0.60
8x5x5½	.065	4	1.00
10x6x6¼	.110	6¾	1.50
11x6x6¼	.120	8	1.65
12x6x6¼	.140	8¾	1.80
12x7x7¼	.150	10⅝	2.10
12x8x7	....	17⅝	3.10
14x6x6¼	.203	12¼	2.35
14x7x7¼	.250	13½	2.45
15x7x7¼	.260	14	2.60
16x7x7¼	.270	14½	2.85
16x8x7	....	18¼	3.65
18x8x8½	.380	22	4.10
24x8x8½	.432	33½	5.30
Style B			
4x1½x2¼	.0035	¼	$0.25
7x3½x5	.032	2	.58
Style B—Continued			
8x3½x5	.038	3¼	$0.65
10x4x5½	.066	4	1.10
12x5½x7½	.104	7	1.65
16x6½x9	.238	13½	2.60
Style C			
6x4½x4	....	2¼	$0.70
7x4½x4	....	....	.80
8x4½x4	.037	3	.85
10x5 x4	.048	3½	1.20
12x5 x4	.057	5	1.35
14x6 x6	.112	6¼	1.60
12x7 x5½	....	10¾	2.20
16x7 x5½	.157	11	2.40
18x8 x8	.290	14¼	3.25

Bold-faced type indicates stock sizes.

ELEVATOR BOLTS

Reliance Head

Fig. 1911
NO. T-581

Excelsior Head

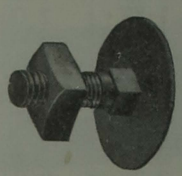


Fig. 1912
NO. T-582

Button Head

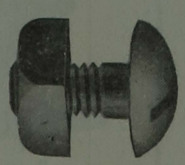


Fig. 1913
NO. T-583

Carriage Bolt

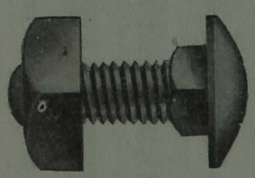


Fig. 1914
NO. T-584

Peerless

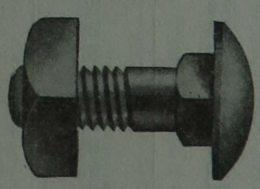


Fig. 1915
NO. T-582

The Peerless Type (No. T-587) is a large oval head bolt especially adapted to elevators handling fertilizer and acid phosphate. **List prices are the same as for excelsior flat-head bolts.**

Length, Inches	Excelsior Bolts Diameter in Inches			Reliance and Button Bolts Diam., Inches	Carriage Bolts Diameter in Inches			
	5/16 and 1/4	5/16	3/8	5/16 and 1/4	5/16 and 1/4	5/16	3/8	1/2
¾	$2.20	$3.00	$4.20	$2.50	.....	.....	.....	.....
⅞ and 1	2.30	3.00	4.30	2.60	$1.00	$1.40	$1.90	$3.25
1¼	2.40	3.20	4.40	2.80	1.00	1.40	1.90	3.25
1½	2.50	3.40	4.50	2.00	1.00	1.40	1.90	3.25
1¾	2.60	3.60	4.60	2.20	1.10	1.52	2.06	3.25
2	2.70	3.80	5.70	2.40	1.10	1.52	2.06	3.25
2¼	.....	.....	.....	.....	1.20	1.64	2.22	3.25
2½	.....	.....	.....	.....	1.20	1.64	2.22	3.25
3	.....	.....	.....	.....	1.30	1.76	2.38	3.53
3½	.....	.....	.....	.....	1.40	1.88	2.54	3.81
4	.....	.....	.....	.....	1.50	2.00	2.70	4.09

STEEL BUCKETS

CONTINUOUS TYPE

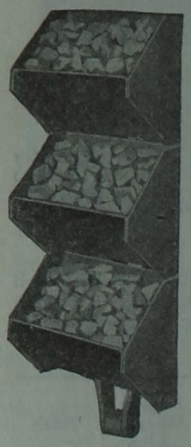


Fig. 1916
NO. T-586

With this type of bucket material is delivered in a continuous flow which insures a large capacity at comparatively slow speeds, reducing the wear upon buckets and chains and giving long life to the equipment.

These buckets are made in various sizes and gauges and are recommended for handling crushed stone, sand, gravel, coal, etc.

They are of the continuous flanged back type, the flanges serving as sides of a discharge chute for the bucket following. Made in two styles, B and D.

Style B is constructed with the front of bucket at an angle of 60 degrees to the back and is most suitable for use in elevators that incline 30 degrees or more from the vertical.

For elevators that are vertical or incline less than 30 degrees from vertical, style D is most suitable. In this style the front of the bucket is built at an angle of 50 degrees with the back.

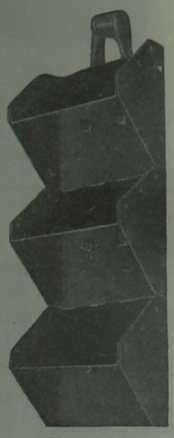


Fig. 1917
NO. T-588
Style B and D

Length Across Belt, Inches	Projection from Belt, Inches	Length With Belt, Inches	Gauge of Steel							
			18	16	14	12	10	8	3/16	1/4
			Each	Each	Each	Each	Each	Each	Each	Each
7	4	6	$0.47	$0.50	$0.52	$0.59	$0.65	....	....	....
8	5	8	.54	.56	.61	.70	.79	....	....	....
10	5	8	.59	.61	.65	.77	.89	....	....	....
10	5½	9	.61	.65	.69	.79	.95	....	....	....
10	6	7¾	.65	.70	.75	.88	1.06	....	....	....
12	6	12	....	.77	.88	1.04	1.24	$1.40	....	....
12	7	12	....	.86	1.00	1.18	1.40	1.55	$1.75	....
12	8	12	....	....	....	1.31	1.58	1.75	1.95	....
14	8	12	....	....	....	1.37	1.69	1.89	2.10	....
14	9	12	....	....	....	1.49	1.87	2.09	2.30	....
16	8	12	....	....	....	1.49	1.82	2.03	2.25	....
16	9	12	....	....	....	1.59	2.00	2.25	2.50	....
18	8	12	....	....	....	1.58	1.91	2.14	2.40	....
18	9	12	....	....	....	1.71	2.16	2.43	2.70	....
20	8	12	....	....	....	1.71	2.12	2.36	2.60	....
20	9	12	....	....	....	1.87	2.34	2.66	2.93	....
20	10	14	....	....	....	2.26	2.75	3.04	3.35	....
22	8	12	....	....	....	1.82	2.25	2.59	2.85	....
22	9	12	....	....	....	2.03	2.50	2.84	3.13	....
22	10	12	....	....	....	2.31	2.72	3.06	3.35	....
22	10	14	....	....	....	2.46	2.90	3.24	3.58	....
22	10	16	....	....	....	....	3.13	3.44	3.80	$4.70
24	8	12	....	....	....	1.96	2.43	2.77	3.06	....
24	9	12	....	....	....	2.18	2.66	3.02	3.35	....
24	10	14	....	....	....	2.67	3.11	3.47	3.85	....
24	10	16	....	....	....	....	3.26	3.60	4.01	5.06
24	12	16	....	....	....	....	....	4.07	4.61	5.69
28	10	16	....	....	....	....	....	4.05	4.59	5.76
28	12	16	....	....	....	....	....	4.68	5.18	6.53
28	14	16	....	....	....	....	....	5.13	5.92	7.52
30	10	16	....	....	....	....	....	4.37	4.93	6.17
30	12	16	....	....	....	....	....	4.91	5.51	6.93
30	14	16	....	....	....	....	....	5.42	6.21	8.06
32	14	16	....	....	....	....	....	5.72	6.62	8.64
34	14	16	....	....	....	....	....	5.99	7.07	9.20
36	14	16	....	....	....	....	....	6.28	7.52	9.77

TROUGHING BELT CARRIERS

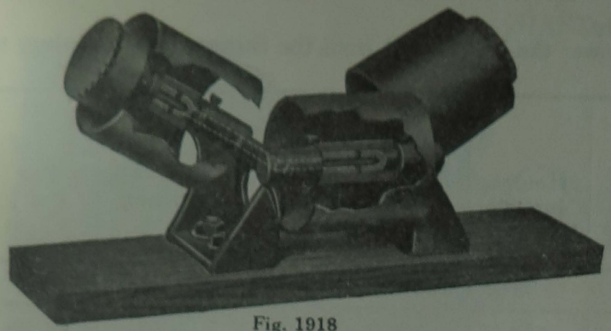


Fig. 1918

NO. T-594

THREE-PULLEY

Exceedingly strong, light in weight and self-oiling, overlapping the pulleys in this type of carrier minimizes the possibility of belt from cutting.

Grease is supplied to the middle pulley through the passage-way from the lower ends of the outside pulleys to both ends of the middle pulley. With a complete filling of the grease passages when first installed, an occasional turn of the cups will insure good lubrication for a considerable period.

IMPORTANT.—To insure the belt running true and central, it should always approach the carrier from the side upon which the horizontal pulley is placed.

Width of Belt, Inches	Approx. Weight with Boards, Lbs.	Length over Pulleys, Inches	Length Over All, Inches	Dia. Pulleys, Inches	Each
14	31	20½	24	5	$6.75
16	33	22¼	26	5	7.00
18	44	26¼	30	6	9.50
20	49	28½	32	6	10.25
24	55	33	36	6	11.00
30	65	39¼	44	6	12.50
36	76	44½	50	6	.....
42	90	51¼	56	6	.....
48	99	57¼	62	6	.....

Price includes Board and Grease Cups. Steel Base Plates furnished at extra cost.

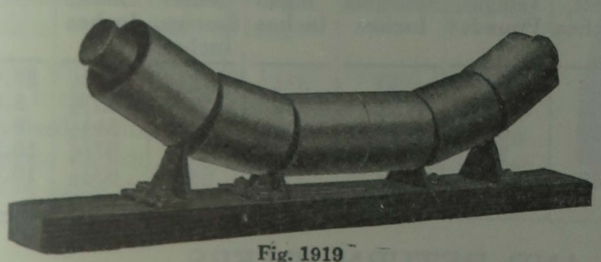


Fig. 1919

NO. T-595

FIVE-PULLEY

Carrier embodies all the high qualities of the Standard Three-Pulley type and in addition permits of a closer conformity to the natural troughing effect of the belt, for the carrying of coal, sand, crushed stone and other heavy bulk materials such as ore, rock, earth, etc.

Width of Belt, Inches	Length Over Pulleys, Inches	Length Over All, Inches	Approx. Weight with Board, Lbs.	Each
24	33¾	36	70	$11.50
30	39¼	44	82	13.00
36	45	50	99	15.50
42	50½	56		18.50
48	55¾	62		21.00

Prices include Board and Grease Cups. Steel Base Plates furnished at extra cost.

RETURN IDLERS

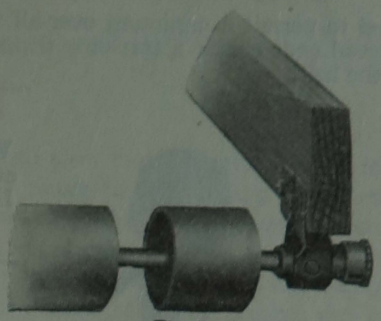


Fig. 1920

NO. T-597

Side-Hanging Swivel-Bearing

Side-Hanging type furnished unless otherwise specified.

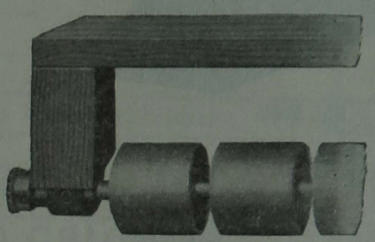


Fig. 1921

NO. T-596

Bottom-Hanging Swivel-Bearing

With Swivel Bearings, and Grease Cups for Two, Three and Five-Pulley Carriers.

Both types can be mounted on either wood or steel stringers.

Width of Belt, Inches	Approx. Weight, Lbs.	Dimensions in Inches					Each
		For Both Side and Bottom Hangers		E For Side Hanger	E For Bottom Hanger	G	
		A	B				
12	22	18	13	22¼	26	3	$4.25
14	23	20	15	24¼	28	3	4.30
16	23	22	17	26¼	30	3	4.35
18	28	24	19	28¼	32½	4	5.10
20	29	26	21	30¼	34½	4	5.15
24	38	30	25	34¼	38½	4	6.00
30	47	38	31	42¼	46½	5	7.00
36	48	44	37	48¼	52½	5	7.40
42	56	50	43	54¼	58½	6	8.00
48	58	56	49	60¼	64½	6	9.00

HANGERS AND BEARINGS FOR ABOVE IDLERS

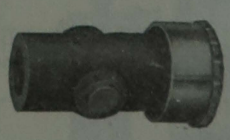


Fig. 1922

NO. T-599

Swivel-Bearing for both Bottom and Side Hangers

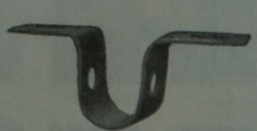


Fig. 1923

NO. T-600

Bottom Hanger

Fig. 1924

NO. T-601

Side Hanger

Pressed Steel Hangers, while lighter in appearance than ordinary cast iron hangers are much stronger in service and therefore a greater insurance to the continuous performance of the conveyer in rough and rugged service.

BELT CONVEYOR GUIDE PULLEYS

Designed to permit a minimum over-all width of conveyor.
The curved ends enable a traveling tripper to raise and lower the belt to and from the carriers without injury to the edge of the belt.

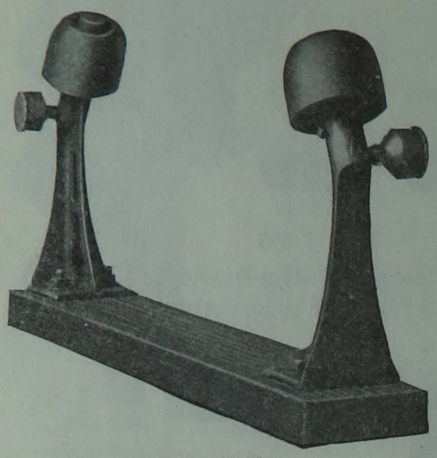


Fig. 1925
NO. T-602

Width of Belt, Inches	Approximate Weight With Board, Pounds	Height, Inches	Length, Inches	Distance Between Stringers, Inches	Length Over-All, Inches	Per Pair†
For Three-Pulley Carriers						
14	21.0	13¾	22¾	20	24	$5.85
16	21.5	13¾	25	22	26	5.85
18	23.0	15¾	26¼	24	30	5.90
20	25.0	15¾	28½	36	32	5.90
24	25.8	16¼	33	30	36	6.00
30	27.5	16¼	39¾	38	44	7.10
For Five-Pulley Carriers						
24	25.8	16¼	33¼	30	36	6.35
30	30.5	16⅞	37	38	44	7.50
36	35.0	17¼	43⅜	44	50	7.50

†Price includes board and grease cups. Steel plates furnished extra.

STANDARD CARRIERS FOR FLAT BELTS

Carriers including bearings may be used for both carrier and return idler service, by mounting them upon separate wood stringers placed above each other, or upon the top and bottom of one pair of stringers.

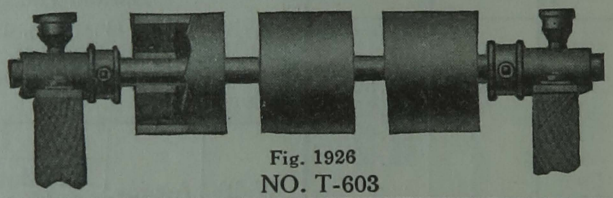


Fig. 1926
NO. T-603

Width of Belt, Inches	Approximate Weight, Pounds†	Distance Between Stringers Inches	Height of Bearings, Inches	Distance Center to Center Bearings, Inches	Length of Shaft, Inches	Each	Width of Belt, Inches	Approximate Weight, Pounds†	Distance Between Stringers Inches	Height of Bearings, Inches	Distance Center to Center Bearings, Inches	Length of Shaft, Inches	Each
12	34	18	3⅜	20	24	$5.20	24	54	30	3⅝	32½	37½	$7.60
14	35	20	3⅜	22	26	5.20	30	64	38	3⅝	40½	45½	8.85
16	35	22	3⅜	24	28	5.50	36	66	44	3⅝	46½	51½	9.00
18	43	24	3⅜	26½	30½	6.25	42	76	50	3⅝	52½	57½	10.20
20	44	26	3⅜	28½	32½	6.30	48	77	56	3⅝	58½	63½	10.35

COMBINATION CARRYING AND RETURN IDLERS

WITH STANDS FOR FLAT BELTS

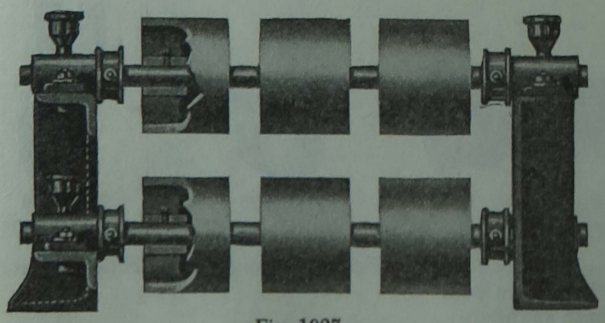


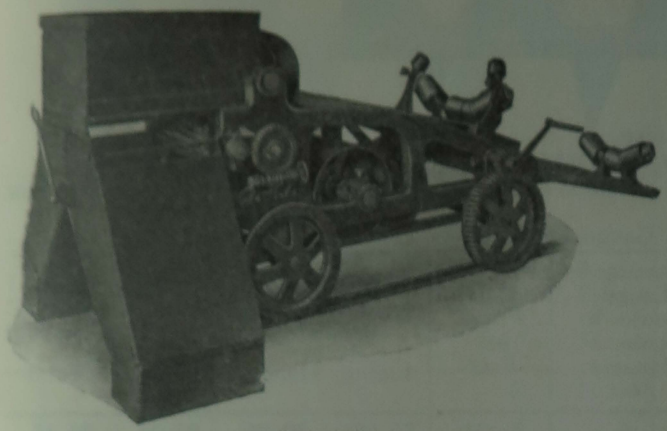
Fig. 1927
NO. T-604

Width of Belt, Inches	Approximate Weight, Pounds†	Dist. Bet. Bearings, Inches	Length Over Pulleys, Inches	Height to Center of Shaft, Inches	Height Over-All, Inches	Length of Shaft, Inches	Each
12	63	17¼	13	3⅛	5⅝	24	$13.35
14	64	19¼	15	3⅛	5⅝	26	13.40
16	64	21¼	17	3⅛	5⅝	28	14.00
18	72	23¾	19	3⅛	5⅝	30½	15.50
20	72	25¾	21	3⅛	5⅝	32½	15.60
24	83	29¾	25	3⅜	5⅞	37½	18.15
30	94	37¾	31	3⅜	5⅞	45½	20.65
36	95	43¾	37	3⅜	5⅞	51½	20.95
42	105	49¾	43	3⅜	5⅞	57½	23.40
48	107	55¾	49	3⅜	5⅞	63½	23.70

*For price of combination carrier without return idler, deduct price for one standard carrier idler as listed above.
†Complete as illustrated.

BELT TRIPPERS

HAND PROPELLED



Designed to meet requirements where it is desired to discharge at numerous fixed points, can be moved along the track to a desired point by means of a crank handle and pinion engaging a gear on the traction wheel; is secured in position by means of a hand clamp on supporting rail. Rotary cleaning brushes can be supplied for belts handling adhesive materials.

Fig. 1928

NO. T-605

Size of Belt, Inches	Approximate Weight, Lbs.	Each with Spout, but without Trailer or Brush	Add for Trailer with Idler		Add for Brush Device with Standard Brush, Each
			Approximate Weight, Lbs.	Each	
14	2625	$430.00	122	$17.00	$110.05
16	2650	437.00	125	17.75	111.75
18	2700	451.00	131	18.70	113.45
20	2800	458.00	135	19.45	115.15
24	2900	483.00	155	20.60	118.55
30	3100	515.00	180	22.05	123.65

SELF-PROPELLED

Equipped with trailers and idlers for belts handling heavy loads. Can be readily changed from automatic to hand reversing, by the removal of the trip lever mechanism. Designed to meet the requirements where it is desired to distribute the material in long piles or bins.

The tripper can be set to any desired length of run. It travels back and forth on the track between two fixed points, automatically reversing and discharging its load as it moves along. This tripper can be made stationary, permitting it to discharge at any fixed point in its run.

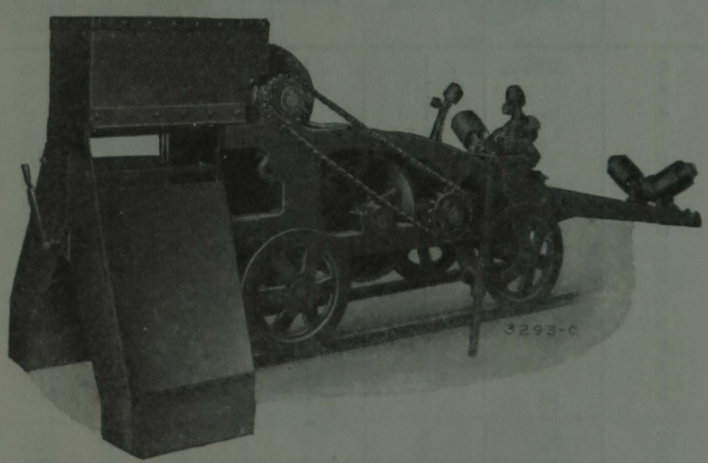


Fig. 1929

NO. T-606

Width of Belt, Inches	Self-Propelled Hand-Reversing without Trailer		Add for Automatic Reverse		Add for Trailer with Idlers		Add for Brush Device with Standard Brush
	Approximate Weight, Pounds	Each	Approximate Weight, Pounds	Each	Approximate Weight, Pounds	Each	Each
14	3530	$656.00	100	$15.00	122	$17.00	$110.05
16	3570	662.00	100	15.00	125	17.75	111.75
18	3650	704.00	100	15.00	131	18.70	113.45
20	3820	714.00	100	15.00	135	19.45	115.15
24	4030	745.00	100	15.00	155	20.60	118.55
30	4280	788.00	100	15.00	180	22.05	123.65
36	4530	820.00	100	15.00	210	24.00	128.75

Cross-section and clearance dimensions furnished on application.

STEEL SPIRAL CONVEYORS

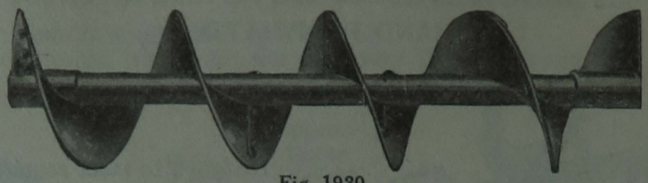


Fig. 1930

SECTIONAL FLIGHTS

For Grain and similar light non-abrasive materials only. Made of a series of single spiral turns riveted together and securely mounted on a hollow shaft.

With Standard Gauge Flights

Diameter Conveyor, Inches	Gauge of Center Flight	Size Pipe Inside, Inches	Size Coupling, Inches	Approx. Pitch of Flights, Inches	Standard Length Center to Center of Hangers, Feet	*List Price, per Foot	Deduction per Foot of Conveyor if Fittings Are Not Furnished			
							Lining	Hangers	Coupling	Total
4	18	1	1	4	8	$1.75	$0.06	$0.06	$0.04	$0.16
6	16	1½	1½	6	10	2.00	.09	.07	.06	.22
9	14	1½	1½	9	10	2.50	.15	.09	.06	.30
12	12	2	2	12	12	3.50	.20	.14	.09	.43
14	10	2½	2 7/16	12	12	5.00	.31	.20	.11	.62
16	10	3	3	16	12	6.25	.39	.28	.15	.82
18	10	3	3	18	12	7.50	.46	.31	.15	.92

Price for Galvanized Conveyor will be quoted on application. List price includes Standard Gauge Curved Lining, one No. 13 Hanger and one Coupling with each Standard (full length) section. When Lengths shorter than Standard are ordered, no flttings will be furnished, unless so specified, for which an extra charge will be made.

With Heavy Gauge Flights

Diameter Conveyor, Inches	Thickness of Flights, Inches	Size Pipe Inside, Inches	Size Coupling, Inches	Approx. Pitch of Flights, Inches	Standard Length Center to Center of Hanger, Feet	*List Price, per Foot	Add for Extra Heavy Pipe per Foot of Conveyor	Deductions per Foot of Conveyor if Fittings Are Not Furnished		
								Hangers	Couplings	Total
4	10Ga	1	1	4	8	$2.75	$0.35	$0.08	$0.06	$0.14
4	3/16	1	1	4	8	3.00	.35	.08	.06	.14
4	1/4	1	1	4	8	3.50	.35	.08	.06	.14
4	1/4	1½	1	4	8	3.75	.40	.08	.06	.14
6	10Ga	1½	1½	6	10	3.00	.50	.10	.08	.18
6	3/16	1½	1½	6	10	3.50	.50	.10	.08	.18
6	1/4	1½	1½	6	10	4.00	.50	.10	.08	.18
6	3/8	2	1½	6	10	5.80	.60	.10	.08	.18
9	10Ga	1½	1½	9	10	3.75	.50	.12	.08	.20
9	10Ga	2	2	9	10	4.25	.60	.14	.12	.26
9	3/16	1½	1½	9	10	4.75	.50	.12	.08	.20
9	3/16	2	2	9	10	5.50	.60	.14	.12	.26
9	1/4	1½	1½	9	10	5.50	.50	.12	.08	.20
9	1/4	2	2	9	10	6.25	.60	.14	.12	.26
9	3/8	2	2	9	10	8.00	.60	.14	.12	.26
12	3/16	2	2	12	12	6.00	.60	.20	.11	.31
12	1/4	2	2	12	12	7.00	.60	.20	.11	.31
12	1/4	3	3	12	12	8.50	1.20	.29	.22	.51
12	3/8	3	3	12	12	11.50	1.20	.29	.22	.51
14	3/16	2½	2 7/16	12	12	7.50	.90	.29	.16	.45
14	1/4	2½	2 7/16	12	12	8.50	.90	.29	.16	.45
14	3/8	3	3	16	12	13.00	1.20	.35	.22	.57
16	3/16	3	3	16	12	9.00	1.20	.40	.22	.62
16	1/4	3	3	16	12	10.00	1.20	.40	.22	.62
16	3/8	3	3	16	12	15.00	1.20	.40	.22	.62
16	1/2	4	3	16	12	20.00	2.35	.40	.22	.62
18	3/16	3	3	18	12	12.50	1.20	.44	.22	.66
18	1/4	3	3	18	12	14.00	1.20	.44	.22	.66
18	3/8	3	3	18	12	20.00	1.20	.44	.22	.66
18	1/2	4	3	18	12	27.00	2.35	.44	.22	.66
20	3/16	3	3	18	12	14.00	1.20	.53	.22	.75
20	1/4	3	3	18	12	16.50	1.20	.53	.22	.75
20	3/8	3	3	18	12	24.00	1.20	.53	.22	.75
20	1/2	4	3	18	12	32.00	2.35	.53	.22	.75

* List price includes one No. 13 or No. 17 Hanger and Coupling with each standard (full length) section. When lengths shorter than standard are ordered, no fittings will be furnished unless so specified, for which an extra charge will be made. (No lining furnished with heavy conveyor)

STEEL HELICOID CONVEYORS

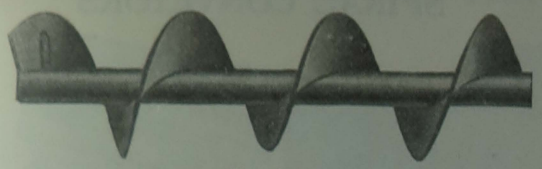


Fig. 1931

CONTINUOUS FLIGHTS

Stock Sizes

Diam. Spiral, Inches	Thickness Flights: Next Pipe	Thickness Flights: Outer Edge	Diam. Coupling, Inches	Inside Diam. Hollow Shaft, Inches	Hangers Center to Center, Inches	Plain Steel, Per Foot	Galv. Steel, Per Foot
4	.125	.05	1	1¼	8	$1.40	$1.90
5	.....	.....	1	1¼	8	2.00	2.70
6	.125	.063	1½	1¾	10	2.00	2.70
7	.125	.0703	1½	1¾	10	2.50	3.50
8	.1875	.11	1½	2	10	2.50	3.50
9	.1875	.10	1½	2	10	2.50	3.50
9 Spec.	.....	.....	2	2½	10	3.25	4.55
10	.1875	.093	1½	2	10	3.00	4.20
12	.25	.12	2	2½	12	3.50	5.00
12Spec	.....	.....	2 7/16	3	12	4.50	6.25
14	.25	.12	2 7/16	3	12	5.00	7.00
16	.3125	.17	3	3½	12	6.25	8.75

Extra Heavy Made to Order Sizes

4x	3/16	.11	1	1¼	8	2.50	.....
6x	¼	.125	1½	1¾	10	3.00	.....
6xx	3/8	.2	1½	1¾	10	3.50	.....
7x	¼	.141	1 3/16	1½	10	3.75	.....
9x	3/8	.172	1½	2	10	4.75	.....
9xx	3/8	.19	2	2½	10	5.50	.....
10xx	3/8	.19	2	2½	10	6.50	.....
12x	3/8	.17	2	2½	12	6.00	.....
12xx	3/8	.18	2 7/16	3	12	7.00	.....
12xxx	½	.25	3	3½	12	8.50	.....
14xx	7/16	.234	3	3½	12	8.00	.....
16xxx	½	.25	3	4	12	10.00	.....

Prices include with each standard length, One Hanger (Style No. 13, 14, 17, or 18), One Coupling, necessary bolts and Standard Lining. No. 13 Hangers furnished unless otherwise specified. Allowances made for parts not furnished.

BEARINGS

FOR STEEL SPIRAL CONVEYORS

FOR WOOD TROUGHS

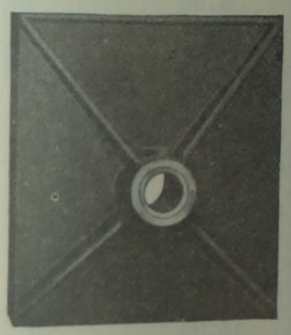


Fig. 1932

NO. T-619

Diameter Spiral, Inches	Diameter Shaft, Inches	Each
4	1	$2.00
6	1½	3.00
9	1½	4.50
9	2	5.00
10	1½	5.50
10	2	6.00
12	2	8.00
12	2 7/16	9.00
12	3	10.00
14	2 7/16	11.50
16	3	15.00
18	3	17.00
20	3	21.00

BEARINGS

FOR STEEL SPIRAL CONVEYORS

FOR STEEL TROUGHS

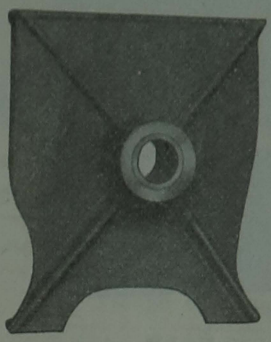


Fig. 1933

NO. T-619

Diameter Spiral, Inches	Diameter Shaft, Inches	Each
4	1	$2.00
6	1½	3.00
9	1½	4.50
9	2	5.00
10	1½	5.50
10	2	6.00
12	2	8.00
12	2 7/16	9.00
12	3	10.00
14	2 7/16	11.00
16	3	15.00
18	3	17.00
20	3	23.00

DISCHARGE END BEARING

Dia. Spl., Ins.	Dia. Shaft, Ins.	Each
4	1	$1.75
6	1½	2.75
9	1½	4.00
9	2	4.50
10	1½	5.00
10	2	5.50
12	2	7.00
12	2 7/16	8.00
12	3	9.00
14	2 7/16	10.00
16	3	12.50
18	3	15.00
20	3	.....

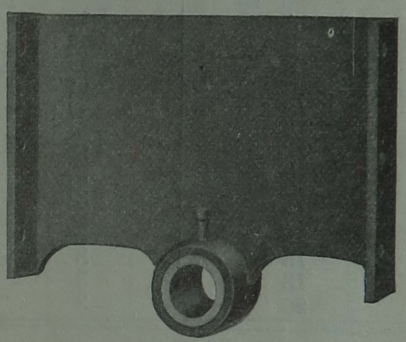


Fig. 1934

NO. T-616

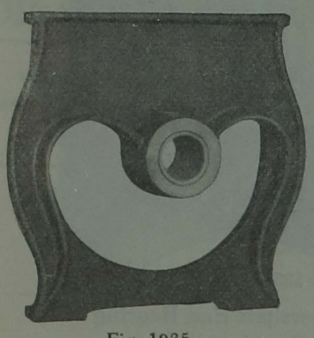


Fig. 1935

Discharge End Bearing

NO. T-629

Prices on Application

MITER GEAR END BEARING

For Wood Troughs

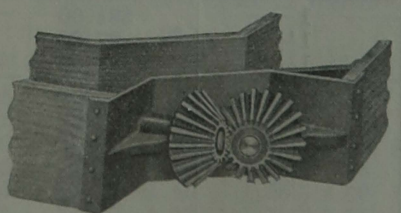


Fig. 1936

Dia. Spl., Ins.	Dia. Shaft, Ins.	Each
4	1	$22.00
6	1½	28.00
9	1½	50.00
12	2	80.00

Price includes end bearing with gears and shafts having drive extension for countershaft end bearing of 4 inches for one inch shaft, 6 inches for all other sizes.

BEARINGS FOR STEEL SPIRAL CONVEYORS

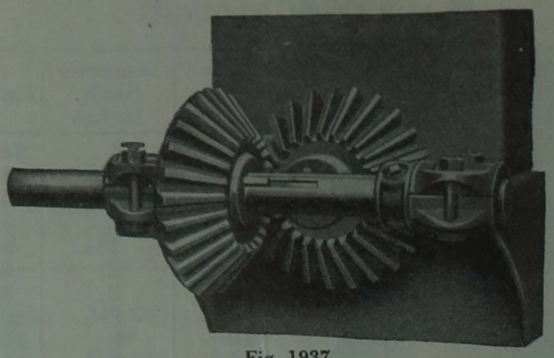


Fig. 1937

NO. T-615—Countershaft End Bearing
FOR WOOD TROUGHS

Diameter Spiral, Inches	Diameter Shaft, Inches	Each
4	1	$21.00
6	1½	27.00
9	1½	33.00
9	2	39.00
10	1½	43.00
10	2	48.00
12	2	54.00
12	2 7/16	63.00
12	3	72.00
14	2 7/16	75.00
16	3	126.00
18	3	135.00
20	3	

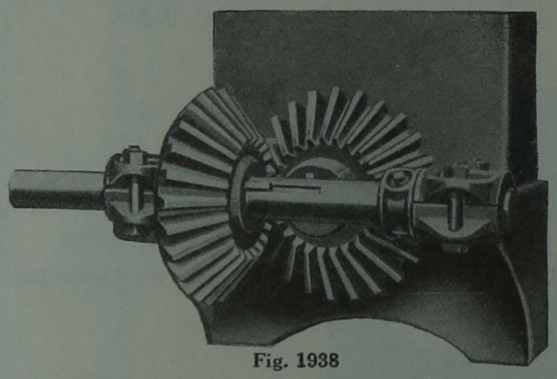


Fig. 1938

NO. T-618—Countershaft End Bearing
FOR STEEL TROUGHS

Diameter Spiral, Inches	Diameter Shaft, Inches	Each
4	1	$21.00
6	1½	27.00
9	1½	33.00
9	2	39.00
10	1½	43.00
10	2	48.00
12	2	54.00
12	2 7/16	63.00
12	3	72.00
14	2 7/16	75.00
16	3	126.00

Price includes end bearing with gears and shafts having drive extension of 4 inches for 1-inch shaft and 6 inches for other sizes.

RIGHT ANGLE DRIVES FOR STEEL SPIRAL CONVEYORS

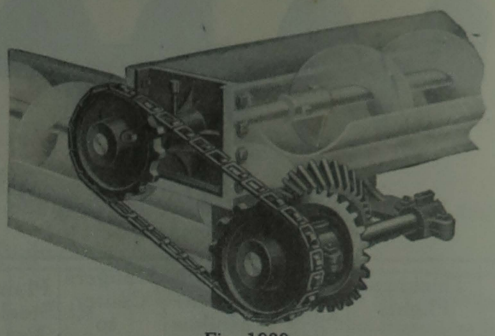


Fig. 1939
NO. T-610

Dia. Spiral, Inches	Dia. Shaft, Inches	Wood or Steel Trough, Each	Dia. Spiral, Inches	Dia. Shaft, Inches	Wood or Steel Trough Each
4	1	$38.00	10	2	$85.00
6	1½	45.00	12	2	95.00
8	1½	55.00	12	2 7/16	105.00
9	1½	60.00	14	2 7/16	135.00
9	2	68.00	16	3	205.00
10	1½	77.00			

Price includes end bearings, gears, shaft, sprockets, chain and set collars.

STEEL TROUGHS FOR STEEL SPIRAL CONVEYORS

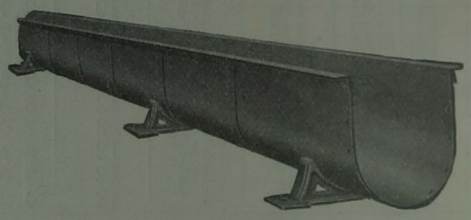


Fig. 1940
NO. T-621

Dia. Conveyor, Inches	Trough, Without Cover				Covers	
	Gauge Steel	Size Angles, Inches	W'ght per Foot, Lbs.	Per* Foot	Gauge Steel	Per Foot
4	18	1¼x1¼x3/16	5½	$2.25	20	$0.60
	16	1¼x1¼x3/16	6½	2.75		
	14	1¼x1¼x3/16	7½	3.25		
6	16	1¼x1¼x3/16	7½	2.75	18	.85
	14	1½x1½x3/16	9	3.25		
	12	1¼x1¼x3/16	11	4.00		
	10	1¼x1¼x3/16	13	5.00		
9	14	2x1½x3/16	13	4.00	16	1.15
	12	2x1½x3/16	16	5.00		
	10	2x1½x3/16	19	6.00		
	3/16	2x1½x3/16	24	8.75		
	1/4	2x1½x3/16	31	10.50		
12	12	2x2x3/16	20½	6.00	16	1.45
	10	2x2x3/16	25	7.50		
	3/16	2x2x3/16	31½	10.50		
	1/4	2x2x3/16	41	12.75		
16	12	2x2x3/16	25	8.25	16	1.60
	10	2x2x3/16	30	9.75		
	3/16	2x2x3/16	39	12.75		
	1/4	2x2x3/16	51	15.00		

*Price for lots of not less than 50 feet. Add 10% for less than 50 feet.

STEEL LINING FOR WOOD CONVEYOR BOXES

Fig. 1941
NO. T-610

Diam. Conveyor, Inches	Width of Sheet, Inches	Length of Sheet, Inches	Standard Lining for Wood Boxes		Heavy Lining for Wood Boxes—Price per Lineal Foot								
			Gauge of Steel	Price per Lineal Foot	Gauge of Lining								
					22	20	18	16	14	12	10	3/16 Inch	1/4 Inch
4	8	30	24	$0.18	$0.21	$0.25	$0.35	$0.40					
6	12	30	24	.25	.30	.40	.50	.60	$0.70				
9	18	30	22	.50		.55	.75	.85	1.00	$1.35	$1.80		
10	20	30	20	.60		.60	.80	.90	1.15	1.55	2.00		
12	24	30	20	.70		.70	.95	1.10	1.35	1.85	2.40	$3.40	
14	28	30	18	1.20			1.20	1.40	1.70	2.30	3.00	3.90	
16	32	30	18	1.30			1.30	1.50	1.85	2.45	3.10	4.40	$5.50
18	36	30	18	1.45			1.45	1.65	2.05	2.80	3.60	4.90	6.40

SHORT SADDLES FOR STEEL TROUGHS

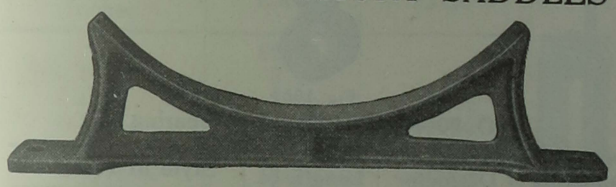


Fig. 1942
NO. T-622

Diam. Conveyor, Inches	4	6	9	10	12	14	16	18
Each	$1.00	1.25	1.50	1.70	2.00	2.25	2.50	3.00

FLANGED SADDLES FOR STEEL TROUGHS

Diameter Conveyor, Inches	With Feet as Illustrated, Each	Without Feet for Unsupported Joint, Each	Diameter Conveyor, Inches	With Feet as Illustrated, Each	Without Feet for Unsupported Joint, Each
6	$2.50	$1.75	14	$9.00	$7.00
9	4.50	3.50	16	11.00	9.00
10	5.50	4.50	18	13.00	11.00
12	7.50	6.00			

.Order in pairs for one complete joint.

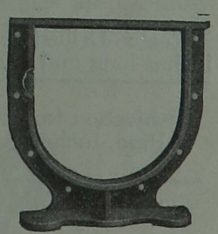


Fig. 1943
NO. T-623

SECTIONAL FLIGHTS FOR STEEL SPIRAL CONVEYORS

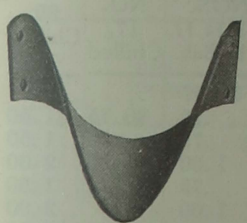


Fig. 1944
NO. T-609

In ordering flights be particular to state pitch of screw, inside or outside diameter of pipe, and whether right or left hand.

List Price per Lineal Foot

Sizes, Inches	Standard		Thickness of Flights in Inches								
	Center Flights	End	16 Gauge	14 Gauge	12 Gauge	10 Gauge	3/16	1/4	5/16	3/8	1/2
4	$0.30	$0.35	$0.30	$0.35	$0.40	$0.55	$0.60	$0.80	.....	.....	.....
5	.45	.50	.45	.50	.60	.75	.....	.....	.....	.....	.....
6	.45	.50	.....	.50	.60	.75	.85	1.05	$1.30	$1.75	.....
7	.65	.80	.....	.65	.80	1.00	1.15	1.45	1.75	2.25	.....
8	.85	1.10	.....	.85	1.10	1.40	1.60	2.00	2.50	3.00	.....
9	.95	1.50	.....	.95	1.20	1.50	1.70	2.15	3.00	3.60	$5.50
10	1.25	1.85	.....	.....	1.50	1.85	2.00	2.60	3.60	4.25	6.50
12	1.80	2.35	.....	.....	1.80	2.35	2.70	3.30	4.50	5.50	8.50
14	3.25	3.25	.....	.....	.....	3.25	3.85	4.70	6.00	7.00	11.00
16	4.00	4.00	.....	.....	.....	4.00	4.80	6.00	7.50	9.00	13.50
18	5.20	6.15	.....	.....	.....	5.20	6.15	7.50	9.50	11.50	17.00
20	8.00	8.00	.....	.....	.....	.....	8.00	10.00	12.50	15.00	22.00

CONTINUOUS FLIGHTS FOR HELICOID CONVEYORS

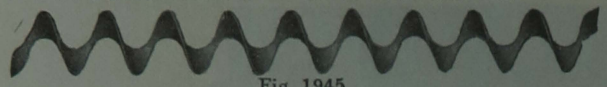


Fig. 1945

Diam. Spiral, Inches	Approx Pitch, Inches	Outside Diam. Pipe, Inches	Per Foot	Diam. Spiral, Inches	Approx Pitch, Inches	Outside Diam. Pipe, Inches	Per Foot
4Std.	4½	1⅝	$0.509	XX	9½	2⅞	$2.00
4X	4½	1⅝	.801	0 Std.	9½	2⅜	1.25
5 Std.	6	1⅝	.801	0 XX	9½	2⅞	2.25
6 Std.	6½	2⅛	.801	2 Std.	12	2⅞	1.40
6 X	6½	2⅛	1.001	2 Spec.	12	3½	1.40
6XX	6½	2⅛	1.501	2X	12	2⅞	2.50
7 Std.	6½	2⅛	1.001	2XX	12	3½	2.50
7X	6	1⅞	1.501	2XXX	12	4	3.50
8 Std.	9½	2⅜	1.001	4 Std.	14½	3½	1.75
9 Std.	9½	2⅜	1.001	4XX	14½	4	3.25
9 Spec.	9½	2⅞	1.001	6 Std.	16½	4	2.50
9X	9½	2⅜	2.001	6XXX	16½	4½	5.00

Note.—In ordering state whether right or left hand.

COUPLING AND DRIVE SHAFTS FOR STEEL SPIRAL CONVEYORS

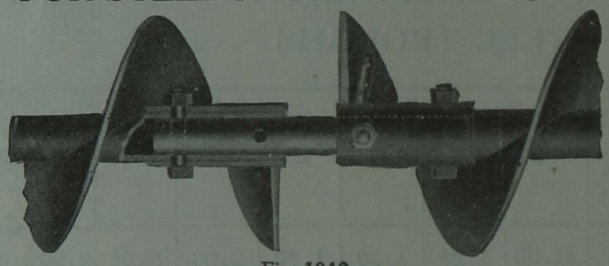


Fig. 1946

NO. T—611

Coupling space between conveyor sections is for Hanger "Length of Bearing," longer space upon order.

Drive End Shafts

Each—Drilled for bolts with keyway not more than 6 inches long and one standard square key.

Projection from Pipe, Inches	Diameter of Shaft in Inches				
	1 Inch	1½ Inches	2 Inches	2 7/16 Inches	3 Inches
6	$1.00	.....	.....	.....	.....
7	.....	.....	.....	.....	.....
8	1.10	$1.90	.....	.....	.....
9	1.15	2.00	.....	.....	.....
10	1.20	2.10	$3.35	$5.20	.....
11	1.25	2.30	3.75	5.75	.....
12	1.25	2.30	3.75	5.75	$8.55
14	1.35	2.55	4.10	6.25	9.35
16	1.45	2.75	4.45	6.80	10.15
18	1.55	3.00	4.85	7.35	11.00
24	1.85	3.60	5.90	8.95	13.40
30	2.20	4.25	7.10	10.65	15.90
36	2.50	4.80	8.15	12.20	18.25
48	3.10	5.15	10.25	15.35	23.00
Projection for Std. Drive Shafts, Ins..	6	9	10	11	12
Length Over All Std. Drive Shafts, Ins..	9	14	15	16	17

For price of standard tail end deduct 25 per cent. from coupling price.

For tail ends longer than standard add per extras shown for drive shafts.

To arrive at approximate length over all for drive shafts add 3 inches for 1 inch diameter shafts and 5 inches for larger diameter shafts.

HANGERS FOR STEEL SPIRAL CONVEYORS

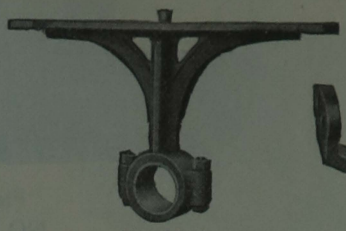


Fig. 1947

NO. 13—Babbitted

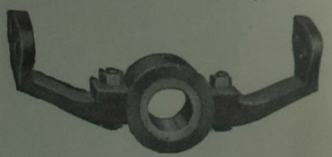


Fig. 1948

NO. 14—Babbitted

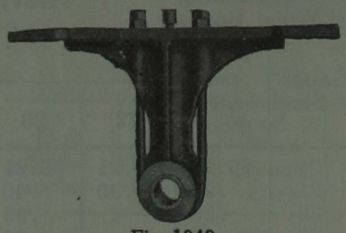


Fig. 1949

NO. 17—Babbitted, in Sizes Noted*

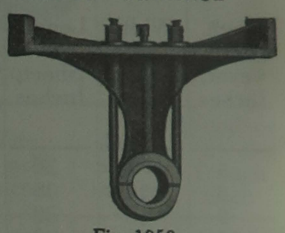


Fig. 1950

NO. 18—Babbitted

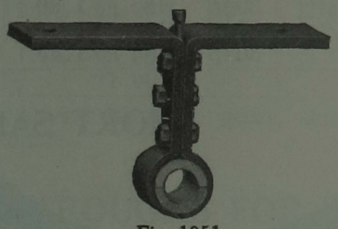


Fig. 1951

NO. 20—Chilled Cast Iron Bearing

Diameter Conveyor, Inches	Diameter Coupling, Inches	Length of Bearing, Inches	Style of Hanger		
			NO. 13	NO. 17	NO. 20
4	1	1½	$2.00	$2.25	.....
6	1½	2	2.25	2.75*	$8.00
9	1½	2	3.00	3.50*	8.50
9	2	2	3.50	4.00*	9.00
10	1½	2	3.75	4.25	9.00
10	2	2	4.25	4.75	9.50
12	2	2	4.50	5.00*	10.00
12	2 7/16	3	6.00	6.50	10.50
12	3	3	7.50	8.00	11.00
14	2 7/16	3	7.50	8.50	12.50
16	3	3	10.50	11.50*	15.00
18	3	3	11.50	12.50	17.00
20	3	..	14.00	15.00	20.00

Diameter Conveyor, Inches	Diameter Coupling, Inches	Length of Bearing, Inches	Hanger Bearings		
			Hanger Caps		NO. 20, Chilled
			NOS. 13, 14, 17, 18, Bab.	NO. 17, Chilled	
4	1	1½	$0.50	.....	.....
6	1½	2	.75	$0.75	$1.50
9	1½	2	.75	.75	1.50
9	2	2	1.00	1.00	2.00
10	1½	2	.75	.....	1.50
10	2	2	1.00	.....	2.00
12	2	2	1.00	1.00	2.00
12	2 7/16	3	1.50	.....	3.00
12	3	3	2.00	2.00	4.00
14	2 7/16	3	1.50	.....	3.00
16	3	3	2.00	2.00	4.00
18	3	3	2.00	.....	4.00
20	3	..	2.00	.....	4.00

*Furnished in babbitted or chilled bearing.

Prices of Nos. 14 and 18 on Application

ADJUSTABLE TAKE-UP BOXES

BABBITTED BEARINGS

Style B—NO. T-624

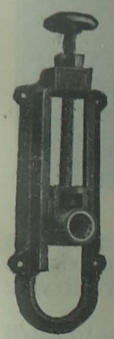


Fig. 1952

Diameter Shaft, Inches	Short, Each	Long, Each
1 3/16	$3.10	.....
1 7/16	3.35	.....
1 11/16	4.45	$5.45
1 15/16	4.50	5.45
2 3/16	5.80	7.25
2 7/16	6.70	7.50
2 11/16	8.60	9.75
2 15/16	8.60	9.75
3 3/16	11.75	17.50
3 7/16	11.75	17.50
3 11/16	14.50	21.00
3 15/16	14.50	21.00

Short adjustment furnished unless otherwise specified. 1 15/16-Inch frame is not as shown; has but 2 holes in base, one in each end.

Style C—NO. T-625

Diameter Shaft, Inches	Short, Each	Long, Each
15/16	$2.40	.....
1 3/16	3.10	.....
1 7/16	3.35	.....
1 11/16	4.45	$5.45
1 15/16	4.50	5.45
2 3/16	5.80	7.25
2 7/16	6.70	7.50
2 11/16	8.60	9.75
2 15/16	8.60	9.75
3 3/16	11.75	17.50
3 7/16	11.75	17.50
3 11/16	14.50	21.00
3 15/16	14.50	21.00

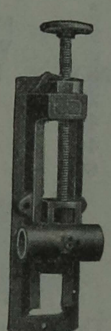


Fig. 1953

Short adjustment furnished unless otherwise specified.

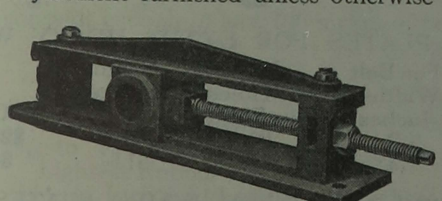


Fig. 1954

Style D—NO. T-626

Diam. Shaft, Inches	Adj., Inches	Each	Diam. Shaft, Inches	Adj., Inches	Each
1 7/16	11 3/4	$6.15	2 15/16	22 1/4	19.95
1 15/16	12	8.15	3 3/16	15 1/4	22.00
1 15/16	18	9.10	3 7/16	15 1/4	22.60
2 3/16	14	9.10	3 7/16	29 3/4	29.70
2 3/16	20	10.10	3 15/16	15 1/4	24.80
2 7/16	15	9.90	3 15/16	35 3/4	36.90
2 7/16	20	10.80	4 7/16	12 1/4	35.55
2 11/16	11	14.80	4 7/16	24 1/4	43.35
2 11/16	22 3/4	18.60	4 15/16	23 3/4	69.80
2 15/16	10 1/2	15.10	4 15/16	37 5/8	88.75

Short adjustment furnished unless otherwise specified. Extra long adjustment, ball and socket bearing take-ups.

BALL AND SOCKET AND SWIVEL TAKE-UPS

GREASE OILING BEARINGS

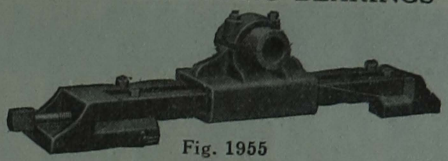


Fig. 1955

NO. T-627

Style "DD" Especially Adapted to Long Belt Conveyors

Makes practically impossible the binding of the shaft by uneven alignment or unequal adjustment of a pair of the take-ups, while swivel bearings with flexibility in a horizontal plane only, fill all ordinary requirements in the uneven adjustment of bearings. Swivel type is the same in general appearance as the ball and socket type, but with the slide angle bolts answering also for the hold-down bolts to timber or steel supports.

The adjustments are standard, but may be increased upon order, from 2 to 3 feet to suit requirements. Note additional prices in table.

Size Shaft, Inches	For Standard Adjustment, Each	Adjustment	
		Standard Adjustment Inches	Additional Price Per Extra Foot of Adjustment
2 7/16	$25.00	24	$1.50
2 15/16	36.00	24	2.20
3 3/16	38.00	24	2.50
3 7/16	41.00	24	3.00
4 7/16	74.00	36	4.00
4 15/16	85.00	36	5.00
Swivel Type			
3 15/16	62.00	37	3.60
4 7/16	71.00	37	4.00

SINGLE FRICTION HOISTS

Thoroughly and substantially built for hard service. Their wide faced, tarred fibre friction, large shafts and rugged bearings are carefully and securely assembled to substantially built structural steel frames.

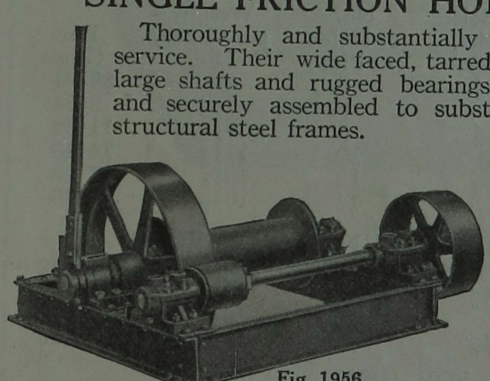


Fig. 1956

NO. T-628

Size, NOS.	Diameter Drum, Inches	Diameter Drive Pulley, Inches	Complete with Pulley, Each
1	8x24	16x 6	$180.00
2	12x24	20x 8	275.00
3	18x30	30x 8	350.00
4	24x30	36x10	600.00

Size, NOS.	Max. Economical Size of Wire Rope in Lbs. to be used								
	At of Ultimate Rope Strength							At 1/3 of Ultimate Rope Strength	
	5/16	3/8	7/16	1/2	9/16	5/8	3/4	5/16	3/8
1	450	500	300	....	....	....	....	1000	1000
2	600	750	750	650	....	....	....	1300	1300
3	800	1150	1350	1500	1350	....	....	1600	1600
4	...	1320	1700	2000	2000	2300	2300	1700	1800

BELT FASTENERS
CRESCENT

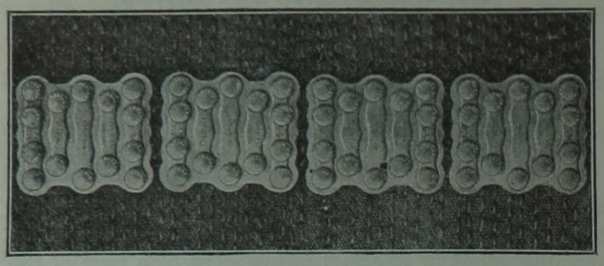


Fig. 1957

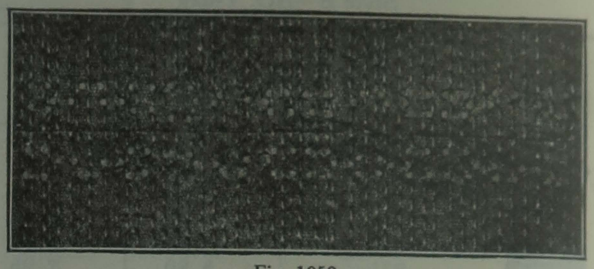


Fig. 1958

Universally used on all kinds and sizes of belts on open drives, quarter turn, half turn, and cross belt drives. Sizes completely cover every belting service from light high-speed to and including extremely heavy. Assure maximum transmission of power. Make certain the belt's best service and longest life. None of the lengthwise power-carrying fibres are cut away or weakened; full strength of belt is maintained and reinforced at joint by the plate.

Fig. 1959

The butt ends of the belt are held smoothly and tightly together. There is no uneveness to catch hands or clothing. No prongs or sharp points to tear clothes or flesh. Nothing can work loose, open up or fly off.

Plates are used singly on narrow belts and in multiple to cover larger belt widths. Various sizes cover every condition of work. The belt ends are butted tightly together making the belt endless for all practical purposes. The rivets which grip the belt to the plate merely separate the lengthwise belt fibres but do not cut or injure them.

SHORT GRIP PLATES FOR LIGHT WORK
PULLEYS 3 INCH OR LARGER

NOS.	For Belt Widths, Inches	No. of Holes in Plate	Weight per Gross, Lbs.	Per Gross
25	¾-1	2	1¾	$2.88
45	1½	4	3¼	5.76
65	2	6	4½	8.64
85	2½	8	5½	11.52
805	3	8	6½	11.52

MEDIUM GRIP PLATES FOR GENERAL WORK
PULLEYS 6 INCH OR LARGER

NOS.	For Belt Widths, Inches	No. of Holes in Plate	Weight per Gross, Lbs.	Per Gross
67	1½	6	6	$8.64
607	2	6	7½	8.64
87	2½	8	9½	11.52
107	3	10	11½	14.40
127	3½	12	15¼	17.28
147	4	14	16½	20.16

PULLEYS 9 INCH OR LARGER

63	2	6	10½	$11.52
83	2½	8	12½	14.40
103	3	10	16½	17.28
123	3½	12	20½	20.16

FOR HEAVY WORK
PULLEYS 12 INCH OR LARGER

NOS.	For Belt Widths, Inches	No. of Holes in Plate	Weight per Gross, Lbs.	Per Gross
109	2½	10	11½	$17.28
149	3	14	24½	23.04
1409	3½	14	30½	25.92
189	4	18	34¼	28.80

LARGE SHANK RIVETS FOR ATTACHING ABOVE PLATES

Thickness Belt, Inches	Length Rivet, Inches	Per Gross	Thickness Belt, Inches	Length Rivet, Inches	Per Gross
2/16	5/16	$0.70	7/16	10/16	$0.90
3/16	6/16	.70	8/16	11/16	1.00
4/16	7/16	.80	9/16	12/16	1.00
5/16	8/16	.80	10/16	13/16	1.10
6/16	9/16	.90	11/16	14/16	1.10

Note.—For belts wider than belt widths listed use 2 or more plates.

HIGH SPEED PLATES FOR LIGHT WORK
PULLEYS 2 INCH OR LARGER

NOS.	For Belt Widths, Inches	No. of Holes in Plate	Weight per Gross, Lbs.	Per Gross
20	¾-1	2	1¼	$2.88
40	1	4	1½	5.76
44	1¼	4	2¼	5.76
60	2	6	3½	8.64

PULLEYS 4½ INCH OR LARGER

66	1½	6	4	$8.64

SMALL SHANK RIVETS FOR ATTACHING HIGH SPEED PLATES

Thickness Belt, Inches	Length Rivet, Inches	Per Gross	Thickness Belt, Inches	Length Rivet, Inches	Per Gross
2/16	5/16	$0.50	5/16	8/16	$0.55
3/16	6/16	.50	6/16	9/16	.60
4/16	7/16	.55	7/16	10/16	.60

JUMBO PLATES FOR EXTRA HEAVY WORK

NOS.	For Belt Widths, Inches	No. of Holes in Plate	Weight per Gross, Lbs.	Per Gross
1611	3	16	33½	$28.80
2211	4	22	51½	34.56

JUMBO RIVETS FOR JUMBO PLATES

Thickness Belt, Inches	Length Rivet, Inches	Per Gross	Thickness Belt, Inches	Length Rivet, Inches	Per Gross
5/16	10/16	$1.25	9/16	14/16	$1.55
6/16	11/16	1.40	10/16	15/16	1.70
7/16	12/16	1.40	11/16	16/16	1.70
8/16	13/16	1.55	13/16	18/16	1.85

Rivet holders supplied with all Crescent Fasteners without charge.

CRESCENT RIVET EXTRACTORS

The rivets do not injure a belt and if it is desired to disconnect a belt, it can be easily done by withdrawing the rivets along one edge of the joint using a rivet extractor. The extractor is a specially designed tool similar to a pair of pincers.

	Each
NO. 79—Length, 8 Inches; Weight each, 13 Ounces	$1.00

BELT FASTENERS

BRISTOL

Stamped from strips of especially tested cold rolled steel. Belts can be quickly and easily joined without special tools—a hammer and soft wood block are all that are necessary

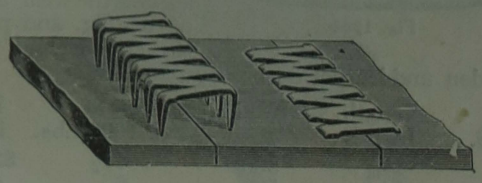


Fig. 1960

NO. 1 STYLE, FOR LEATHER BELTS

Packed in Assorted Widths

Each box contains enough to lace 100 inches of belt.

NOS.	Thickness and Kind of Belt	Wgt. Per Box, Lbs.	Per Box, 100 Ins.
00	1/16 to 1/8 Inch Split and Extra Light	1/4	$1.00
0	1/8 to 3/16 Inch Split and Light	5/8	1.00
1	3/16 to 1/4 Inch Ordinary Single	1	1.50
2	1/4 to 5/16 Inch Extra Heavy and Wide Single	2	2.00
3	5/16 to 3/8 Inch Double	2 3/4	2.50
4	3/8 to 7/16 Inch Heavy Double	3 1/2	3.00
5	7/16 to 9/16 Inch Extra Heavy Double	4 3/4	3.50

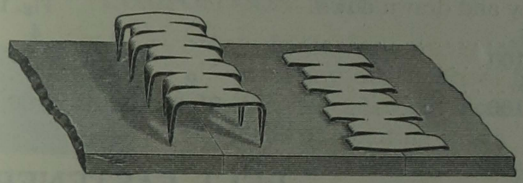


Fig. 1961

STAGGERED POINT STYLE FOR ALL KINDS OF BELTS

Packed in Assorted Widths

Box contains enough to lace 100 inches of belt.

NOS.	Thickness and Kind of Belt	Wgt. Per Box, Lbs.	Per Box, 100 Ins.
1100	1/16 to 1/8 Inch Split Leather and Lightest Rubber and Cotton	3/8	$0.90
110	1/8 to 5/32 Inch Split Leather and Light Rubber and Cotton	3/4	1.00
110 1/2	5/32 to 1/4 Inch Single Leather and 2 Ply Rubber and Cotton	1 1/4	1.25
111	3/16 to 1/4 Inch Single Leather and 3 Ply Rubber and Cotton	1 1/2	1.50
112	1/4 to 5/16 Inch Extra Heavy and Wide Single Leather and 4 Ply Rubber and Cotton	2 1/2	2.00
113	5/16 to 3/8 Inch Double Leather and 5 Ply Rubber and Cotton	3 1/8	2.50
114	3/8 to 7/16 Inch Heavy Double Leather and 6 Ply Rubber and Cotton	4 7/8	3.00
115	7/16 to 9/16 Inch Extra Heavy Double Leather and 7 Ply Rubber and Cotton	5 1/4	3.50
117	1/2 to 5/8 Inch Conveyor and Extra Double Heavy Rubber and Cotton	8 3/4	4.95
119	5/8 to 13/16 Inch 10 Ply and Extra Heavy Conveyor	11 1/2	6.05

Sizes 115, 117 and 119 are recommended for light, medium and heavy conveyor belts.

BELT FASTENERS

BRISTOL

Stamped from strips of especially tested cold rolled steel. Belts can be quickly and easily joined without special tools—a hammer and soft wood block are all that are necessary.

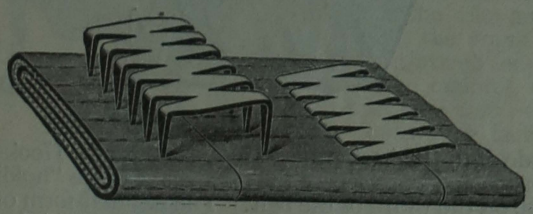


Fig. 1962

NO. 11 STYLE, FOR RUBBER AND COTTON WOVEN BELTS

Packed in Assorted Widths

Each box contains enough to lace 100 inches of belt.

NOS.	Thickness and Kind of Belt	Wgt. Per Box, Lbs.	Per Box, 100 Ins.
100	1/16 to 1/8 Inch Lightest	3/8	$1.00
10	1/8 to 3/16 Inch 2 Ply	1	1.00
11	3/16 to 1/4 Inch 3 Ply	1 1/2	1.50
12	1/4 to 5/16 Inch 4 Ply	2 3/4	2.00
13	5/16 to 3/8 Inch 5 Ply	4	2.50
14	3/8 to 7/16 Inch 6 Ply	5	3.00
15	7/16 to 9/16 Inch 7 Ply	6 3/4	3.50
17	1/2 to 5/8 Inch 8 Ply and Extra Double Heavy Rubber and Cotton	8 3/4	4.95
19	11/16 to 13/16 Inch 10 Ply and Extra Heavy Conveyor Belts	11 1/2	6.05

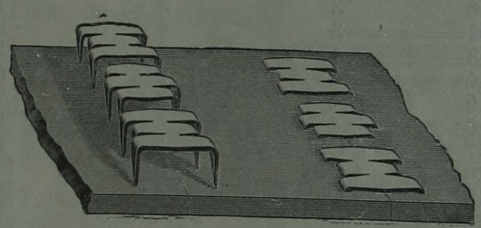


Fig. 1963

THREE POINT WIDTHS ONLY

Box contains 50 pieces, long and short side hooks.

NOS.	Thickness and Kind of Belt	Wgt. Per Box, Lbs.	Per Box, 50 Pcs.
100	1/16 to 1/8 Inch Split Leather and Lightest Rubber and Cotton	1/16	$0.40
310	1/8 to 5/32 Inch Split Leather and Light Rubber and Cotton	1/4	.50
310 1/2	5/32 to 1/4 Inch Single Leather and 2 Ply Rubber and Cotton	1/2	.60
311	3/16 to 1/4 Inch Single Leather and 3 Ply Rubber and Cotton	5/8	.70
312	1/4 to 5/16 Inch Extra Heavy and Wide Single Leather and 4 Ply Rubber and Cotton	1 1/4	1.10
313	5/16 to 3/8 Inch Double Leather and 5 Ply Rubber and Cotton	2	1.70
314	3/8 to 7/16 Inch Heavy Double Leather and 6 Ply Rubber and Cotton	3	2.30
315	7/16 to 9/16 Extra Heavy Double Leather and 7 Ply Rubber and Cotton	4 1/2	3.50
317	1/2 to 5/8 Inch Conveyor, 8 Ply Extra Double Heavy Rubber and Cotton	9 1/8	5.50
319	5/8 to 13/16 Inch 10 Ply and Extra Heavy Conveyor	16 3/4	9.00

BELT HOOKS

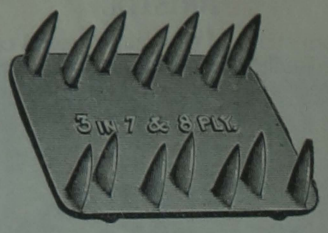


Fig. 1964

Made of the highest grade of malleable iron. Hooks are so constructed as to secure the greatest possible "holding" surface on the width of the belt. The peculiar form of the teeth prevents their cutting the fibre of the belt to injure it.

Adapted to use in any belt, but more particularly for use on single leather belts, especially when used over small pulleys and at high speeds.

FOR LEATHER BELTS

NOS.	Plies	Width Belt, Inches	Per 100
1	Single	1	$1.50
2	Single	1½	2.00
3	Single	2	2.50
4	Single	2½	3.00
5	Single	3	3.50
6	Single	3½	4.50
7	Single	4	5.50
8	Double	2	5.00
9	Double	2½	6.50
10	Double	3	7.50
11	Double	3½	8.50
12	Double	4	9.50

RUBBER OR CANVAS BELTS

26	3	2	4.00
17	3	2½	5.00
20	3	3	7.00
21	3	4	8.00
13	4	2	5.00
14	4	2½	6.50
15	4	3	7.50
16	4	4	9.50
27	4 Old	2	8.00
18	4 Old	3	10.00
19	4 Old	4	12.00
21½	5–6	2½ and 5	9.00
22	5–6	3	10.00
23	5–6	4	12.00
24	7–8	3	12.00
25	7–8	4	15.00

Single leather hooks, 100 in a box. Others, 50 in a box.

BELT COUPLINGS

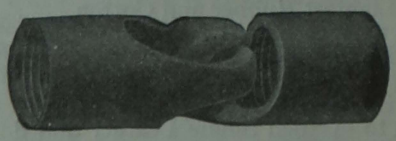


Fig. 1965

Made of best refined steel. For round belts of every description.

Outside Diameter, Inches	1/8	3/16	1/4	3/16
Weight per Dozen, Lbs.	1	1½	2	3
Per Dozen	$3.00	2.50	2.00	2.50
Outside Diameter, Inches	3/8	7/16	1/2	9/16
Weight per Dozen, Lbs.	5	7	10	12
Per Dozen	$3.00	3.50	4.00	5.00
Outside Diameter, Inches	5/8	3/4	7/8	1
Per Dozen	$3.00	3.50	4.00	5.00
Per Dozen	$6.00	9.00	13.00	18.00

BELT HOOKS

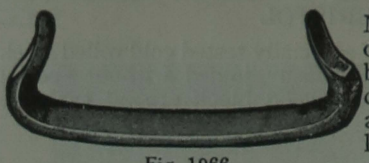


Fig. 1966

Made of the best quality of Norway iron, with beveled points. They clinch perfectly, leaving a smooth surface, which lessens the wear and tear of belting, and prevents the cutting and wearing of wooden and leather covered pulleys.

NOS.	Length, Inches	No. in Box	Weight Per 1000 Lbs.	Per 1000
10	1 5/16	500	4½	$3.50
9	1 1/8	500	6	4.00
8	1 5/16	500	9½	5.00
7	1½	250	11	6.00
6	1 11/16	250	13½	8.50
5	1 7/8	250	17½	11.00
4	2 1/16	200	22	14.00
3	2¼	200	27	16.00
2	2 7/16	200	32	20.00
1	2 5/8	100	36½	30.00
0	2½	100	43	50.00
00	3	100	48	60.00

BELT STUDS

BLAKE'S

For Leather and Rubber Belts

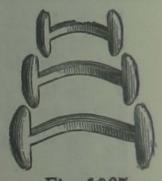


Fig. 1967

Made of special material that will not break in bending over pulleys; joints may be pulled down flat or put over the pulley and drawn down.

NOS.	5	4	3
Per 100	$0.70	.80	.90
NOS.	2	1	0	00
Per 100	$1.25	1.65	2.00	2.50

100 in a Box

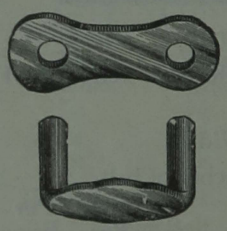


Fig. 1968

BELT FASTENERS

SMITH'S

Made of a special grade of steel. No. 4 is furnished for single or double leather belts; No. 3 for four-ply rubber belts; No. 2 for woven cotton belts only and No. 1 for double leather or heavy rubber belts.

NOS.	4	3	2	1
Length Rivets, Inches	¼ or ½	½	½	½
Weight per 100, Lbs.	1	1 3/8	1 5/8	1 5/8
Per 100	$1.25	1.50	1.75	2.00

100 in a Box

RAWHIDE BELT LACING

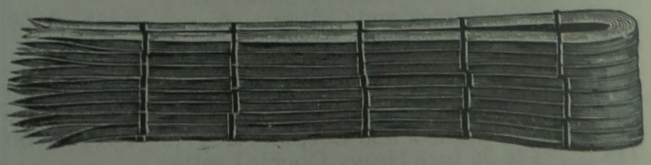


Fig. 1969

Cut from a good grade of rawhide grain leather; smooth finish; well oiled; very soft and pliable; uniform thickness; has great strength.

Proof against moisture, oil, acid and heat.

Width, Inches	1/4	5/16	3/8	
Per 100 Feet	$2.50	3.00	3.75	
Width, Inches	7/16	1/2	5/8	3/4
Per 100 Feet	$4.50	5.50	6.50	7.50

In 100-Foot Bundles

WIRE BELT LACING

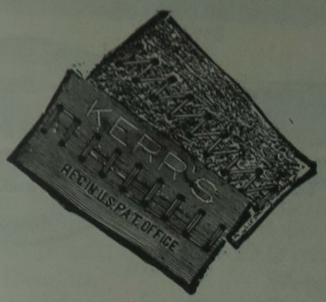


Fig. 1970

Adapted for belts subjected to great strain or to those running at high speed over small pulleys. Will not crystallize and break or stretch or tear out lace-holes. Makes a flush, flexible joint which passes noiselessly over the pulleys.

NOS.	For Belts,	Width Belt Inches	Weight Per 100 Feet, Lbs.	Per 100 Feet
0	Single	To 2½	⅝	$2.00
1	Single	3–5	¾	2.00
2	Single	6–12	⅞	2.00
2	Double	To 6	1	2.00
3	Double	Over 6	1¼	2.00

50 Foot Coil in a Box

COMPOSITION WIRE

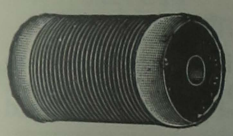


Fig. 1971

Joints made are no thicker than any other part of belt, thereby relieving strain on belt or shafting when the joint goes over the pulley.

NOS.	For Belts Inches	Weight Per 100 Feet, Lbs.	Per 100 Feet
00	½– 1	6	$2.00
0	1 – 2	7¼	2.00
1	2 – 6	8	2.00
2	6 –20	9	2.00
3	20 –40	12¼	2.00

50 Feet on a Spool

BELT LACING OUTFITS

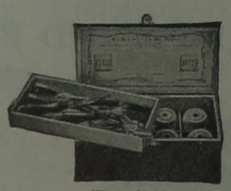


Fig. 1972

A handsomely finished, brass-trimmed, wooden case, containing an assortment of eight, fifty-foot spools of composition wire belt lacing, with a complete set of the tools used in applying it. The tools include a belt marker, belt groover, belt punch and a pair of cutting pliers. Instructions for lacing leather belt are furnished with each outfit.

	Per Set Complete
NO. 1.—Weight per Set, 6¼ Lbs.....	$5.00

BELT LACING MACHINES

Fig. 1973

PEERLESS

Machine consists of three corrugated rolls operated by a crank; a spiral needle is inserted between the rolls and by revolving the crank it is carried through ends of the belt, making small perforations into which the coiled wire lacing is afterward inserted as the needle. The coils are then flattened and forced into belt and ends coupled together with rawhide pins or twine. For single or double belts.

Size, Inches	For Belts, Inches	Lace Furnished, Inches	Weight Each, Lbs.	Each	Extra for Power Attach.
4	4	4000	55	$65.00	$12.50
6	6	6000	140	80.00	12.50
8	8	6000	160	90.00	12.50
12	12	6000	185	100.00	12.50
18	18	8000	310	130.00	12.50
24	24	8000	400	160.00	12.50

Coil lacing, per box of 1000 inches, $1.15. Brass lace, per box of 1000 inches, $5.00. Spiral needles, per dozen, $0.40. Rawhide pins, per bundle of 1000 inches, $2.75. Steel pins, 1000 inches, $0.75. Coupling twine, per ball, $0.30. Cutting pliers, per pair, $2.00.

REPAIR PARTS

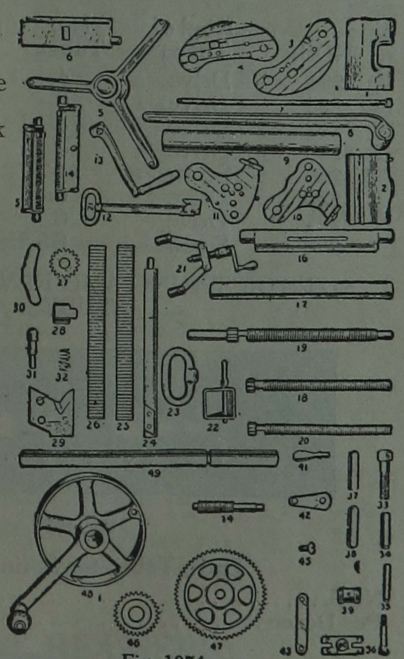


Fig. 1974

NOS.	NAME
1	Upper Jaw.
2	Lower Jaw.
3	Side Link, Needle End.
4	Side Link, Crank End.
5	Tripod.
6	Crank Roll Holder
7	Stand Rod.
8	Lever.
9	Stand Tube.
10	Ear, Needle End.
11	Ear, Crank End.
12	KnifeBarComplete.
13	Crank Handle.
14	Upper Roll Holder.
15	Lower Roll Holder.
16	Eccentric.
17	Bottom Rod.
18	Upper Roll.
19	Crank Roll.
20	Lower Roll.
21	Roll Adjustment.
22	Needle Box.
23	Knife Bar Handle.
24	Knife Bar.
25	Upper Cor. Strip.
26	Lower Cor. Strip.
27	Idler Gear.
28	Guide Stud.
29	Knife Blade.
30	Snap Handle.
31	Snap Pin.
32	Snap Spring.
33	Filister Head, Ear Screw.
34	Center Pin, Crank End.
35	Center Pin, Needle End.
36	Filister Head, Link Screw.
37	Lower Idler Pin.
38	Upper Idler Pin.
39	Adjusting Screw, Sleeve.

NOS.	NAME
40	Adjusting Screw, Nut.
41	Adjusting Screw Crank Handle.
42	Adjusting Screw Crank Blank.
43	Adjusting Link.
44	Adjusting Screw.
45	Knife Screw.
46	Small Power Gear.
47	Large Power Gear.
48	Power Pulley and Shifter.
49	Power Attach. Shaft.

BELT PUNCHES

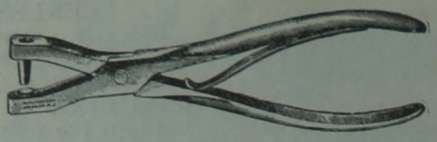


Fig. 1975

SPRING

Full polished, fine tool steel punches, hardened and tempered. Keen, smooth cutting edges.

NOS.	Kind of Tubes	Size Holes Punched	Weight per Dozen, Lbs.	Per Dozen
234	Drive	2 to 10	9	$7.60
235	Drive	2 to 10	9	12.00
236	Screw	2 to 10	9	14.00
237	Screw	2 to 10	5¼	6.40
238	Screw	000 to 1	5¼	8.80
239	Drive	2 to 10	5¼	5.60
240	Drive	000 to 1	5¼	8.00

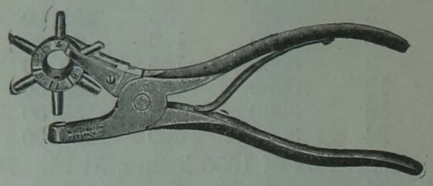


Fig. 1976

REVOLVING TYPE

Joints are carefully fitted and the rollers are made from bar steel. The tubes are drilled so as to clear nicely from the back and are well hardened and tempered.

NOS.	Kind of Tubes	No. Tubes	Weight per Dozen, Lbs.	Per Dozen
224	Drive	4	9	$13.00
225	Drive	6	9½	17.00
227	Drive	4	10	15.00
228	Drive	4	10	20.00
229	Screw	4	10	25.00
230	Drive	6	10½	19.00
231	Drive	6	10½	25.00
232	Screw	6	10½	30.00

SIZES OF SPRING AND REVOLVING PUNCH TUBES.

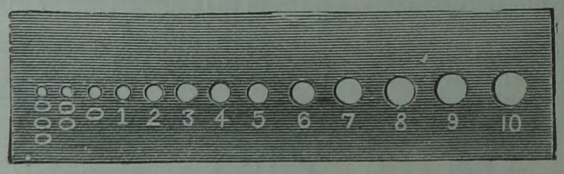


Fig. 1977

Extra Tubes for Spring Punches

NOS.	2–10	000–1
Per Dozen	$1.60	4.00

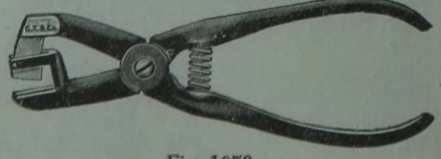


Fig. 1978

FOR BLAKE'S BELT STUDS

Steel cutter; japanned finish; grey iron handles.

NOS.	1	2
For Use on Belts	Leather	Rubber
Weight Each, Lbs.	½	1⅛
Each	$0.90	1.25

NO. 1—Six in a Box. **No. 2—Three in a Box**

BELT PUNCHES

BERNARD

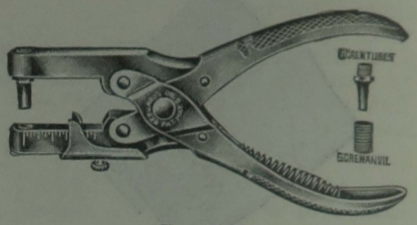


Fig. 1979

Drop forged steel parallel jaws; scored steel handles; swaged and tempered crucible steel tube; heavy rivets at joints; non-friction spring in handle; **full nickel plated;** furnished with adjustable gauge.

Equipped with Nos. 2, 4 and 6 screw tubes.

	Per Dozen
NO. 171—Length, 7 Inches; Weight per Dozen, 10 Lbs.	$12.00
Extra Tubes, Per Dozen	2.00

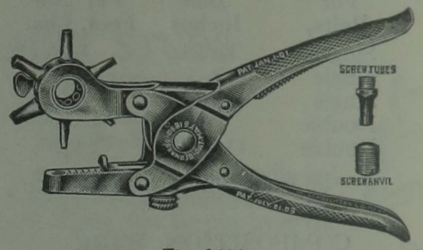


Fig. 1980

REVOLVING TYPE

Parallel jaws which hold the tubes in a vertical position and adjustable gauge to set holes at uniform distance. Made of best crucible steel, **full nickel plated.** Equipped with Nos. 1, 2, 3, 4, 5 and 6 screw tubes.

	Per Dozen
NO. 186—Length, 8 Inches; Weight per Dozen, 14 Lbs.	$24.00
Extra Tubes, Per Dozen	2.00

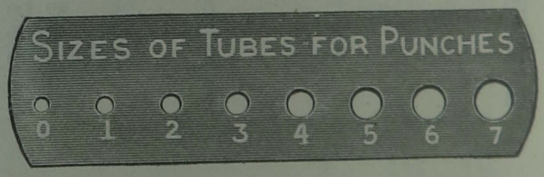


Fig. 1981

BELT PUNCH AND PLIERS

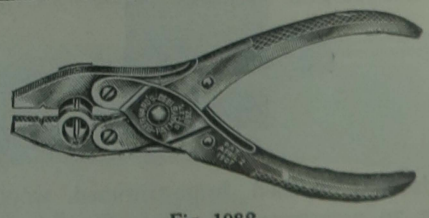


Fig. 1982

For round belts; punch cutter and staple clamping plier. **Full nickel plated finish.** Fine polished tempered jaws and cutting blades. Cuts off belting and pierces it in one operation.

NO. 115

	5	6
Length, Inches	4	5⅜
For Belt, Inches	4½	6½
Weight per Dozen, Lbs.	$12.00	14.00
Per Dozen		

BELT PUNCHES

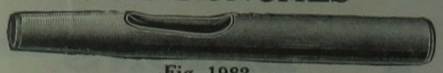


Fig. 1983
Round

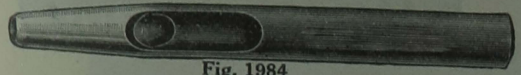


Fig. 1984
Oval

Forged from high grade tool steel, perfectly tempered, designed and ground; carbon finish, polished ends. Style No. 10 is round punch; style No. 20 is oval punch.

NOS.	Diameter Hole, Inches	Length, Inches	Weight Dozen, Lbs.	Style 10-20 Per Dozen
0	3/32	4 1/4	7/8	$3.25
1	7/64	4 1/4	7/8	3.25
2	1/8	4 1/4	7/8	3.25
3	9/64	4 1/4	7/8	3.25
4	5/32	4 1/4	7/8	3.25
5	11/64	4 1/4	1 1/8	3.25
6	3/16	4 1/4	1 1/4	3.25
7	13/64	4 1/4	1 1/4	4.25
8	7/32	4 1/4	2 1/2	4.25
9	15/64	5	2 1/2	4.25
10	1/4	5	3	5.25
11	17/64	5	3	5.25
12	9/32	5	3 1/8	5.25
13	5/16	5	3 1/4	6.25
14	11/32	5	3 1/4	8.25
15	3/8	5	3 1/4	8.25
16	13/32	5	3 1/4	8.25

ARCH PUNCHES

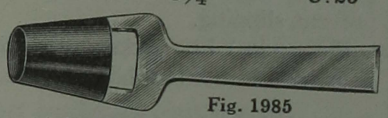


Fig. 1985

Forged from solid bar high grade tool steel; perfectly tempered, designed and ground. For cutting disc washers, wads, etc.

Size, Ins.	Lgth., Ins.	Wgt. Per Doz., Lbs.	Per Doz.	Size, Ins.	Lgth., Ins.	Wgt. Per Doz., Lbs.	Per Doz.
3/8	5	4 1/2	$9.50	17/16	7 1/4	17	$29.00
7/16	5	4 3/4	9.50	1 1/2	7 1/4	18	32.00
1/2	5	4 3/4	10.00	1 5/8	7 1/2	21	35.40
9/16	5 1/2	6 1/2	10.50	1 3/4	7 1/2	23	38.40
5/8	5 1/2	6 1/2	11.00	1 7/8	7 1/2	34	42.00
11/16	5 5/8	7 1/4	11.50	2	7 1/2	25	46.80
3/4	5 5/8	7 1/4	12.00	2 1/8	7 3/4	27	51.60
13/16	5 3/4	10	12.50	2 1/4	7 3/4	28	57.60
7/8	5 3/4	10	13.00	2 3/8	7 3/4	30	64.80
15/16	6	12	13.50	2 1/2	7 7/8	36	73.20
1	6	12	14.00	2 3/4	7 7/8	37	90.00
1 1/16	6 1/2	12	16.00	3	8 1/4	42	108.00
1 1/8	6 1/2	12	18.00	3 1/4	8 1/4	44	130.00
1 3/16	7 1/4	13	20.00	3 1/2	8 1/2	46	150.00
1 1/4	7 1/4	14 1/2	22.00	3 3/4	8 3/4	51	170.00
1 5/16	7 1/4	14 1/2	24.00	4	8 3/4	60	190.00
1 3/8	7 1/4	16	26.00	.....	.....	.....	.....

3/8 Inch to 1 Inch, Six Dozen in a Box
1 Inch to 4 Inches, Twelve Dozen in a Box

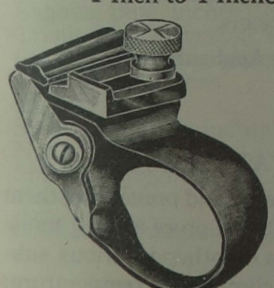


Fig. 1986

LACE CUTTERS

Easily adjusted to cut lacing from 3/16 to 3/4 inch in width.

NO. 28 — Weight per Dozen, 2 3/4 Lbs.; Per Dozen..... $6.00

One in a Box
One Dozen in a Carton

COPPER RIVETS AND BURRS

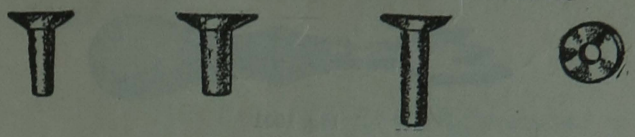


Fig. 1987

Made from pure copper with extra large heads. In 1 or 4 Lb. boxes; uniform lengths.

NOS.	7	8	9	10
Per Lb.	$0.49	.50	.52	.54
NOS.	11	12	13	14	15
Per Lb.	$0.56	.58	.60	.65	.70

In 1 and 4 lb. Boxes

RIVET SETS

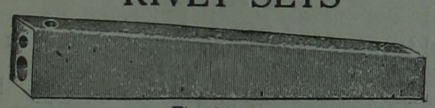


Fig. 1988

No. 50

Forged from high grade tool steel; perfectly hardened and designed; carbon finished handle.

Size	For Iron Rivets, Inches	For Copper Rivets, Inches	Length, Inches	Weight Per Dozen, Lbs.	Per Dozen
00	14	5	5	10	$9.00
0	10	5	5	10	9.00
1	12	6	5	8	7.50
2	8	6	5	8	7.50
3	6	7	4 3/4	8	6.00
4	4–5	8	4 3/4	5	6.00
5	2 1/2–3	9	4 3/4	5	4.40
6	2–1 3/4	10–11	4 1/2	3 7/8	4.40
7	1 1/4	12	4 1/2	3 1/2	3.80
8	1 1/4	13–14	4 1/2	3 1/2	3.80

One Dozen Assorted..... $6.00

Half-dozen in a Box

BELT AWLS

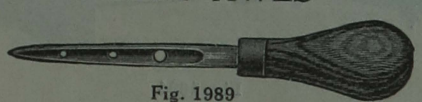


Fig. 1989

For single leather belts. No belt punch is necessary as the awl will make the holes required. Per Dozen

NO. 10—Weight per Dozen, 4 Lbs..... $6.00

One Dozen in a Box

BELT REAMERS

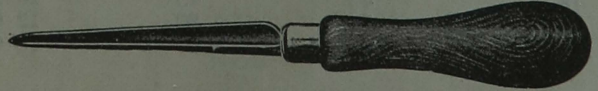


Fig. 1990

Blade drop forged from the best tool steel; spring tempered and polished. Stained and polished hardwood handle. Per Dozen

NO. 12—Length Over All, 8 Inches; Weight per Dozen, 3 Lbs..... $6.00

One Dozen in a Box

BELT MARKERS

Fig. 1991

Made of brass; metal ferrule; rosewood handle.

	Per Dozen
NO. 2014—Length, 5¼ Inches; Weight per Dozen, 2 Lbs.	$3.00

BELT GROOVERS

Fig. 1992

Special tempered steel. For reaming lines in belt to let lace in below surface.

	Per Dozen
NO. 60—Length Over All, 6 Inches; Weight per Dozen, 5 Lbs.	$6.00

BELT KNIVES

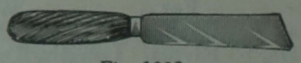


Fig. 1993

SQUARE POINT

Best cast steel blade, round handle.

Length Blade, Inches	3⅞
Width Blade, Inches	⅝
Weight per Dozen, Lbs.	1⅛
Per Dozen	**$2.50**

All Above, One in a Box

BELT CLAMPS

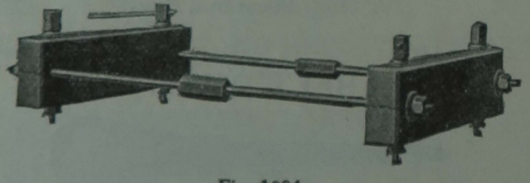


Fig. 1994

Jaws are made of selected rock maple and are shaped on face to grip the belt in such a manner that it cannot slip. Side screws are fitted with hexagon boss at center, and right and left hand nuts at ends.

Width, Inches	Length Side Screws, Inches	Weight Each, Lbs.	Each
12	36	30	$8.00
18	44	45	10.00
24	54	80	12.00
36	66	97	18.00

LEATHER BELT CEMENT

In repairing leather belts or in making them endless, a specially prepared belt cement should be used instead of ordinary mucilage or glue. Our belt cement is easily applied and will stand up under the severest tests.

Put up 1, 2, 5 and 10 Lb. cans.

Per Lb. **$1.25**

BELT DRESSING

Fig. 1995

DIXON'S

Applied to belts while in motion; stops all slipping instantly. Equally satisfactory for leather, rubber, canvas and fabric belting. Put up in cylindrical bars, 2x8 inches. A shape and size very convenient for the hand.

Per Case of 25 Bars	**$8.25**
Per Single Bar	**.40**

Fig. 1996

STEPHENSON

No waste in applying it to the belt, as friction effects an even distribution of the least quantity necessary to prevent slipping.

Put up in 1 Lb. sticks, a very convenient form. It can be carried in the tool box.

	Per Bar
Red Label, for Leather Belts	**$0.50**
Green Label, for Rubber and Canvas Belts	**.50**

CLING-SURFACE

Fig. 1997

A real preservative treatment for leather and cotton belts and ropes. Makes and keeps them pliable, waterproofed and preserved and prevents drying out or cracking.

Prevents all slipping, insuring easy and slack running under full loads.

If kept where it is 60 degrees Fahrenheit or over, it can be used without heating.

Not a sticky treatment, it contains no rosin or other harmful material. Can be used for good rubber or balata belts as well as all other kinds It is a most valuable preservative for transmission ropes.

Packed in 10, 25 and 50 Lb. cans.

Prices Quoted on Application

GOVERNMENT-WATERPROOF

For preserving belts of any material and preventing them from slipping. Makes belts soft and proof against moisture or acids. Contains no rosin or other injurious substances; not affected by any climate or temperature; easily applied without stopping the machinery.

FAIRBANKS REGULAR BULLDOG ENGINES

WITH BUILT-IN OSCILLATING MAGNETOS

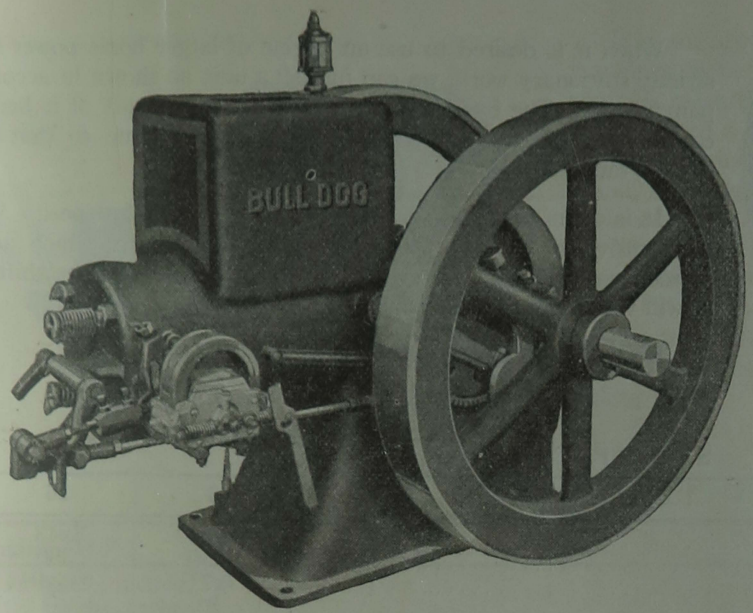


Fig. 1998

THE BULLDOG ENGINE is designed to meet a need for a sturdy, compact, reliable and economical power unit; in horsepower ranging from 2 to 12 inclusive. It is not ponderously built, as excessive weight will produce a bulky and unwieldy unit, hard to handle and generally unsatisfactory. On the other hand, a well-designed engine, such as the Bulldog Engine, with the weight properly distributed and mechanically correct, produces a well-balanced engine at less cost and keeps down the vibration to a minimum. All parts are made strong and durable in order to fulfill their various uses, with a proper percentage of insurance to prevent danger of breakage. The hopper carries sufficient water to cool the engine at all times. A draw-off cock is provided so that the water can be easily and quickly removed.

GAS, GASOLINE OR KEROSENE

2, 4, 6 H.P.

ENGINE.—Four-stroke, four-cycle type, operating on gas, gasoline or kerosene.

IGNITION.—Webster oscillating unit system.

CRANK SHAFT.—All shafts are of drop forged, tough carbon steel, turned and true to size.

GOVERNOR — Of the centrifugal type, with but one-way arm moving in the balance wheel. Simple, effective and never gets out of order. It operates on the fuel supply, thus insuring the greatest economy of operation.

FUEL SUPPLY—The base of the engine forms a strong cast-iron fuel reservoir, doing away with outside connections and removing the possibility of leaks. This method is much more satisfactory than sheet metal tanks which chafe and rust out.

MAGNETO—All Bull Dog Engines, unless otherwise specified, are equipped with Webster Tri-polar Oscillating Magnetos, insuring perfect ignition and doing away with the trouble of wires and batteries.

CARBURETOR is of the suction type and is simplicity itself. There are no moving parts; nothing to wear out or get out of order. The vacuum created by the piston on its outward stroke draws the gasoline from the base of the engine in sufficient quantities to keep the carburetor always sufficiently supplied.

EQUIPMENT—Each engine is thoroughly tested before leaving factory.

Equipment includes: Muffler, wrenches, oiler, can of cylinder oil, oil can, pulley, instruction book, and starting crank for smaller sizes—a complete outfit in every particular.

SPECIFICATIONS

Engine, H.P,	2	4	6
Crank shaft, inches	1⅜x24	1¾x29	2⅛x34
Speed, R. P. M.	450	400	375
Bore and stroke, inches	4x4	5¼x5½	6x7
Diameter flywheel, inches	16	23	32
Exhaust pipe, inches	1	1½	1½
Crank shaft extension, inches	4½	3½	4½
Gasoline capacity, gallons	1½	3½	6
Floor space, inches	24x26	37x29	34x48
Height, inches	17	24	31
Standard pulley, inches	6x4	10x4	14x6
Net weight, lbs.	275	600	....
Shipping weight, lbs.	350	700	....
Code, gasoline	Sad	Saddle	Safely
Code, kerosene	Dago	Dairy	Dale

Send for Special Descriptive Bulletin

All engines are carefully and strongly crated, and delivered f.o.b nearest Fairbanks Branch House to you.

BULL DOG ENGINES ON IRON SUB-BASES

WITH BUILT-IN OSCILLATING MAGNETOS

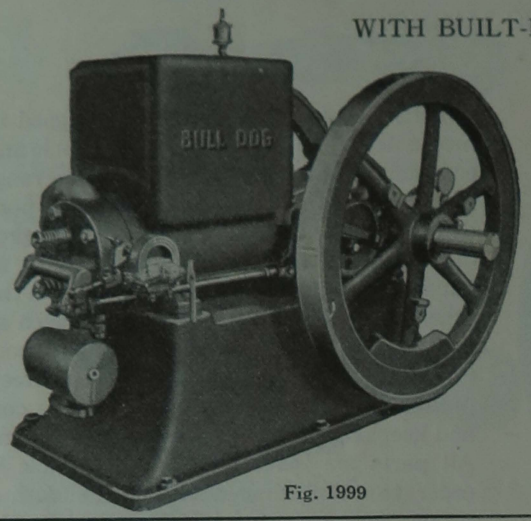


Fig. 1999

When it is desired to use an engine of larger horse power for strictly stationary work, we can furnish a unit as shown in accompanying cut. The base is extra strong and rigid, part of it being cast hollow, which forms a receptacle for the gasoline so that no outside tank is necessary.

It is often desirable and necessary to change the speed. We have provided for this with a speed-change device, which acts directly on governor. By shifting a lever the speed can be shifted at will while the engine is running.

Equipment is same as regular Bull Dog Engine.

Gas, Gasoline or Kerosene 8, and 16 H. P.

SPECIFICATIONS

Engine, H. P.	8	16
Crank Shaft, Inches	2¾x39	3x43
Speed, R. P. M.	350	350
Bore and Stroke, Inches	7x7½	8½x9½
Diameter of Flywheel, Inches	33	40
Exhaust Pipe, Inches	2	2½
Crank Shaft Extension, Inches	5	4
Gasoline Capacity, Gallons	6	10
Floor Space, Inches	56x39	43x66
Height, Inches	37	46
Standard Pulley, Inches	18x7	18x7
Bolt Hole Circle, Inches	11½	11½
Net Weight, Lbs.	1800	2750
Shipping Weight, Lbs.	1950	3000
Code, Gasoline	Shave	Sham
Code, Kerosene	Dean	Debar

SEMI-PORTABLE TYPES—MOUNTED ON SKIDS

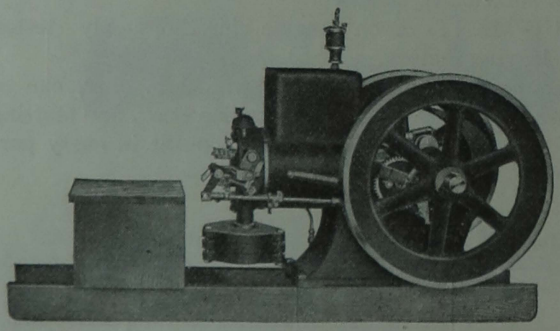


Fig. 2000

Gas, Gasoline or Kerosene 2, 4, 6 H. P.

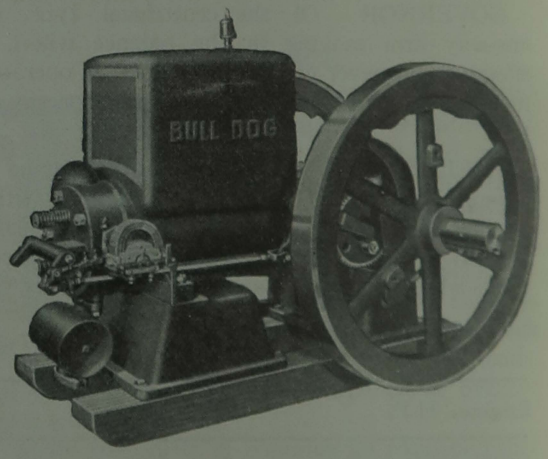


Fig. 2001

Gas, Gasoline or Kerosene 8 and 16 H. P.

SPECIFICATIONS

Engine, H. P.	2	4	6	8	16
Gasoline Capacity, Gallons	1½	3½	6	6	10
Floor Space, Inches	50x24	65x29	68x31	72x39	86x43
Height, Inches	20	28	36	37	46
Standard Pulley, Inches	6x4	10x5	14x6	18x7	18x7
Net Weight, Lbs.	300	650	....	1848	2700
Shipping Weight, Lbs.	350	700	....	2000	2900
Code, Gasoline	Sign	Signet	Sight	Smolt	Smock
Code, Kerosene	Dally	Damage	Dandy	Dabber	Dabster

Send for Special Descriptive Bulletin **All Engines are Carefully and Strongly Crated**

BULLDOG ENGINES MOUNTED ON NO. 3 HAND TRUCK

WITH BUILT-IN OSCILLATING MAGNETOS

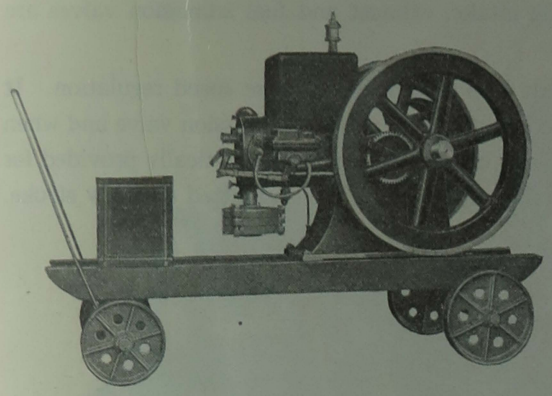


Fig. 2002

It is not always convenient for power users to locate all the machines to be driven where they can be connected to a line shaft or reached by an engine permanently located.

To afford a handy means of moving the smaller sizes of our Bulldog Engine we can supply them mounted on our No. 3 Hand Truck, which is designed to travel over any fairly even surface.

The truck is very strong and substantial with hardwood beams, cast-iron wheels and steel axles—practically indestructible. The forward axle will swing under the platform, permitting the truck to be turned in its tracks.

Full specifications covering the engine are given on a preceding page.

SPECIFICATIONS

Engine, H.P.	2	4	6
Floor space, inches	48x30	65x30	72x34
Total height, inches	35	42	51
Net weight, lbs.	400	750	1225
Shipping weight, lbs.	450	800	1450
Front wheels, inches	10x3	10x3	10x3
Rear wheels, inches	12x3	12x3	12x3
Code, gasoline	Sally	Salmon	Saltant
Code, kerosene	Danger	Daring	Darky

BULLDOG ENGINES MOUNTED ON ALL STEEL TRUCKS

Our 8, 12 and 16 H.P. Bulldog Portable Engines are well adapted for portable work, as they are built without a cast-iron sub-base, thus eliminating as much unnecessary weight as possible. The engine frame is bolted direct to the steel channel beams of the truck, bringing the center of gravity to the lowest point possible, making the outfit very steady when running. All engines are carefully balanced, reducing the vibration to a minimum. These outfits are recommended for work requiring a portable engine.

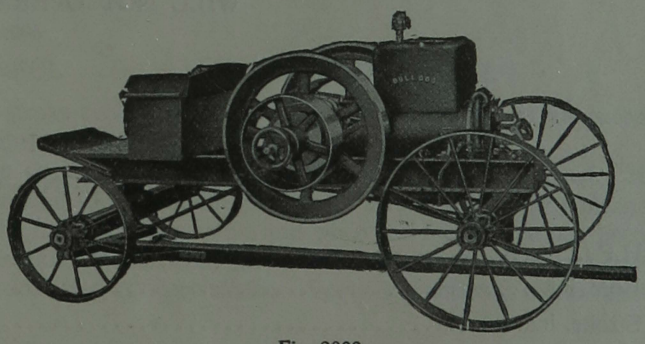


Fig. 2003

Gas, Gasoline or Kerosene—8 and 16 H. P.

SPECIFICATIONS

Engine, H.P.	8	10
Front wheels, inches	26x4	30x6
Rear wheels, inches	34x4	36x6
Capacity, lbs.	4000	6000
Channels	6″x2″x8′	8″x2¼″x9′
Shipping weight, complete, lbs.	2400	3900
Code, gasoline	Smirk	Smelt
Code, kerosene	Debate	Decade

Send for Special Descriptive Bulletin

Note.—In shipping these portable outfits, the wheels are removed and the engine and truck placed on skids and crated so that it can be billed at actual weight and not come under the classification applying to mounted outfits.

BULL DOG OIL ENGINES

Fairbanks Bull Dog Oil Engines are of the four-cycle type. The intake, exhaust and fuel admission valves are mechanically operated.

This engine is like our Regular Bull Dog Gasoline Engine, in that it is susceptible to close speed regulation. It operates just as well under variable as steady loads. The governor is connected with the fuel admission valve and when the fuel charge has been set for a certain speed against a certain load, any change in load is automatically provided for by the opening or closing of the valve by the governor. The proper amount of fuel is then admitted at every stroke. Excellent speed regulation is maintained under varying loads.

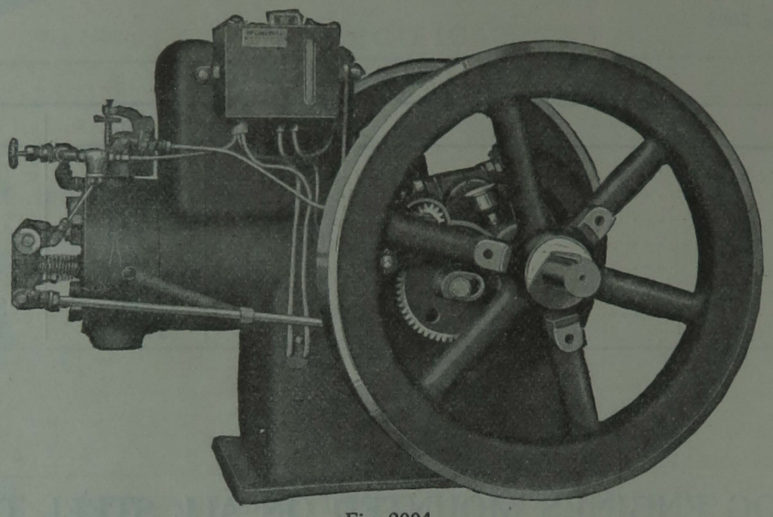


Fig. 2004

WILL NOT OPERATE ON GASOLINE

BURNS—FUEL OIL, KEROSENE OR HEAVY OILS

SPECIFICATIONS—ON IRON SUB-BASE

H.P	6	8	12
Bore, ins	5½	7	7½
Stroke, ins	6	7½	8½
R. P. M	450	400	350
Crank Shaft Main Bearings, ins	2⅝	3½	3¾
Crank Shaft Arms, ins	2⅛	2¾	3
Standard Pulley, ins	12x6	18x7	18x7
Capacity Fuel Tank, gallons	5	6	7
Floor Space, ins	44x25½	61x39	66x43½
Height, ins	26	37	42
Flywheel Diameter, ins	26	35	39
Flywheel Face, ins	3	3½	3¾
Exhaust Pipe, ins	1½	2	2½
Net Weight, lbs	990	2140	2720
Shipping Weight, lbs	1200	2450	2900
Export Weight, lbs	1200	2600	3100

FAIRBANKS SUPER-DIESEL HEAVY OIL ENGINES

AIR STARTING

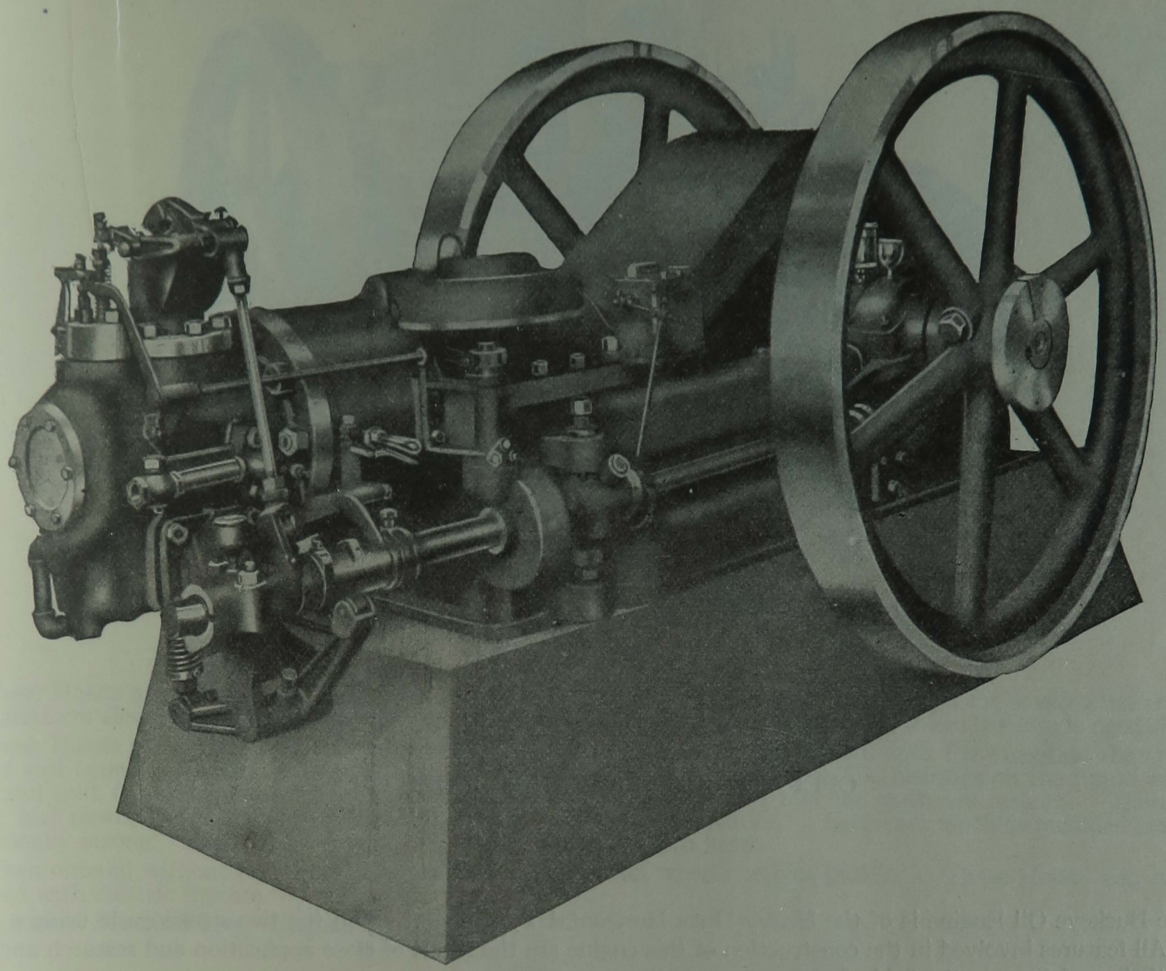


Fig. 2005

SIMPLE POWERFUL ECONOMICAL

FAIRBANKS SUPER-DIESEL engines are of the four-stroke-cycle type. The intake, exhaust, and fuel admission valves are mechanically operated.

This engine is like any heavy duty internal combustion engine in that it runs practically at constant speed. It operates just as well under variable or steady loads. The constant speed is maintained under all sorts of loads by means of a throttling governor. The governor is connected with the fuel admission valve and when the fuel charge has been set for a certain speed against a certain load, any change in load is automatically provided for by the opening or closing of the valve by the governor. Proper amount of fuel is thus admitted at every stroke. Speed is practically maintained constantly against any load change.

NO BATTERIES NO CARBURETOR NO PRE-HEATING
NO MAGNETO NO HOT BULB NO WIRING

Oil engines effect a great saving in fuel cost. First: Because of their ability to operate on low-grade fuels. Second: Because the " Hvid " fuel valve insures perfect combustion, therefore economy. The oil is completely atomized or blown into a fine mist and thoroughly mixed in minute particles with the air in the cylinder, thereby insuring perfect combustion. Ignition is caused by the heat of compression only. The oil is fed by gravity into the fuel cup on the suction stroke where it is atomized, and forced into the cylinder just before the completion of the compression stroke, where it mixes with the air and burns completely. Starts instantly; burns any oil that flows freely; no water is necessary to retard combustion; temperature does not affect starting.

H. P.	Domestic Weight	Floor Space	Cyl.	R. P. M.	Diameter Flywheels	Pulley	Export Weight
20	6300 lbs.	9′6″x4′	8½ x 16″	275	62 ″	30x8″	10400 lbs.
30	10350 lbs.	10′10″x5′5″	10x18″	250	70 ″	36x10″	13500 lbs.

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S 1461

HEAVY DUTY HEAVY OIL ENGINES

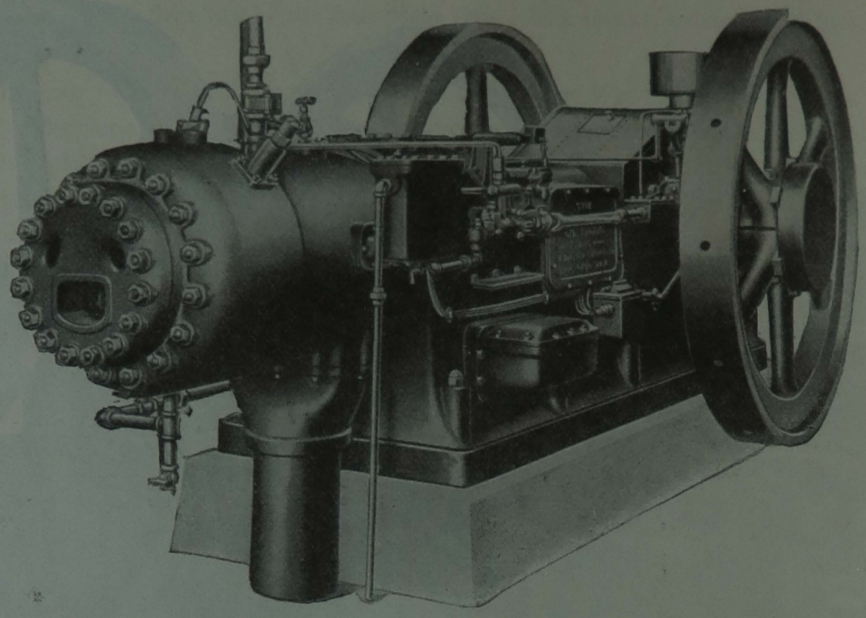


Fig. 2006

OPERATES ON LOW GRADE FUEL OILS

The Buckeye Oil Engine is of the Heavy Duty Horizontal Type operating on the two-stroke cycle using a crosshead. All features involved in the construction of this engine are the result of close application and research and have proven their usefulness in the field of power consumption.

Some of the special features of these engines are as follows: No overhang to either flywheel, permitting drive to be taken from either side. Belt pull is taken on a special outboard adjustable bearing mounted on a floor stand instead of on the crankshaft bearing; an extra large friction clutch is used. Shoes which grip outside and inside of heavy disc bolted to flywheel hub. Has high grade auxiliary engine and air compressor with large supply tank capable of starting engine several times with one filling. Air for combustion is thus secured in the simplest possible manner, without complicated valves, air pipes, etc. High fuel economy and low operating expense.

The engine is without a peer in finish, workmanship and material. The Fairbanks Company O. K. stands shoulder to shoulder with the manufacturer's guarantee.

SPECIFICATIONS

	Single						Twin			
Rated Horse Power	55	65	75	90	110	125	160	190	230	260
Revolutions per Minute	260	260	240	240	210	210	240	240	210	210
Diameter of Flywheel, Inches	66	66	72	72	78	78	72	72	78	78
Face of Flywheel, Inches	6	6	8	8	10	10	8	8	10	10
Diameter of Standard Pulley, Inches	48	48	56	56	60	60	66	66	72	72
Face of Standard Pulley, Inches	12	14	14	16	16	18	22	26	30	36
Diameter Friction Clutch, Inches	30	30	36	36	42	42	48	48	54	54
Approximate Floor Space, Feet	13x10	13x10	14x11	14x11	15x12	15x12	14x15	14x15	15x16	15x16
Domestic Shipping Weight, Lbs.	18,500	20,000	26,500	28,500	31,500	34,000	42,000	46,500	56,000	60,500
Export Shipping Weight, Lbs.	21,000	22,500	29,000	31,500	35,000	37,500	46,000	50,500	61,000	65,500

Prices on Application

HOISTS

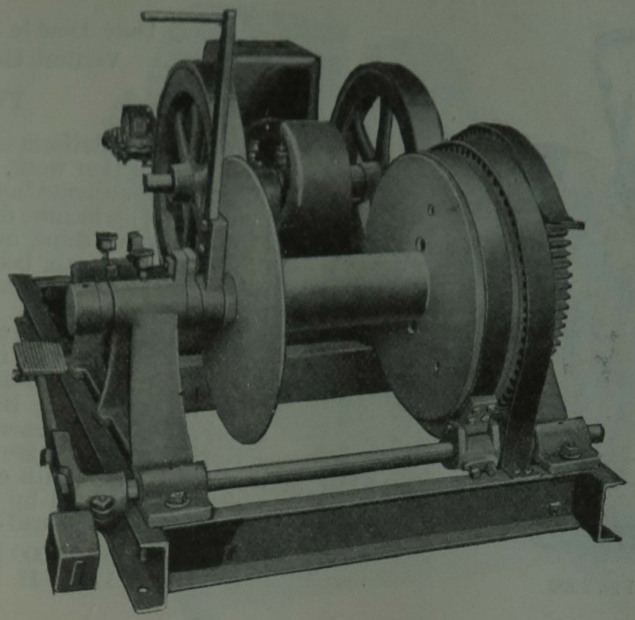


Fig. 2007

Single Drum Geared Hoist with Horizontal Gasoline Engines

TYPE HB

These Hoists are designed for light work and to meet the demands of small contractors for hoisting material, for single platform elevators, handling ice, pulling fish nets and boats and other light work where a Hoist is needed.

These Hoists are designed on the same principle as our others herein described, with the exception that there is no solid cast frame. The frame is mounted on channel iron, light but strong. The bearings on the frame are babbitted and split for adjustment. Drum bearings are not bronze bushed but are machined smooth. There is no ratchet and pawls, but a strong foot brake to hold the load at any elevation. Gears are machine moulded gears and exceptionally strong. Each Hoist is equipped with a separate winch head.

When ordered without power we can furnish either sprocket wheels or belt pulleys. These Hoists can also be equipped with electric motors.

Capacity: 500-1000 Lbs. Engine, 2, 4 H.P.

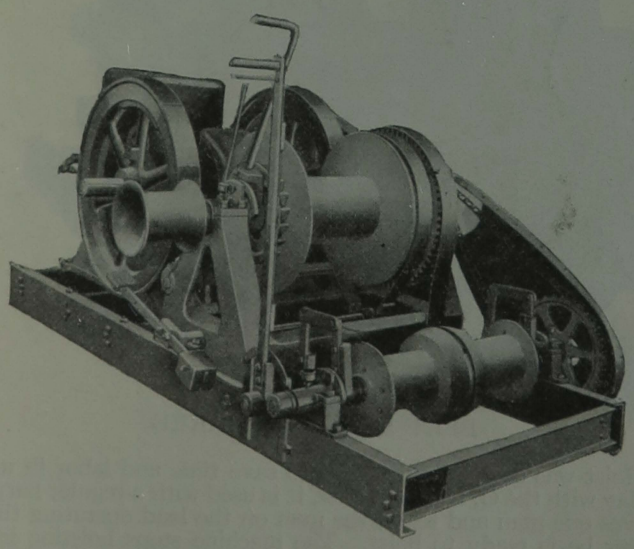


Fig. 2008

Heavy Duty Single Drum Geared Hoist with Horizontal Kerosene Engine, Equipped with Double Drum Boom Swinger

TYPE A

This Hoisting outfit is used for operating derrick, also overhead cranes for loading and unloading sugar cane and other materials.

Reversible Hoists are the same as shown and described above, with reversing clutches added and are operated by a single lever. Rope sheave instead of winch head can be furnished.

Capacity: 1200–3000 Lbs. Engine, 6, 8, 16 H.P.

Send for Special Descriptive Circular

HOISTS

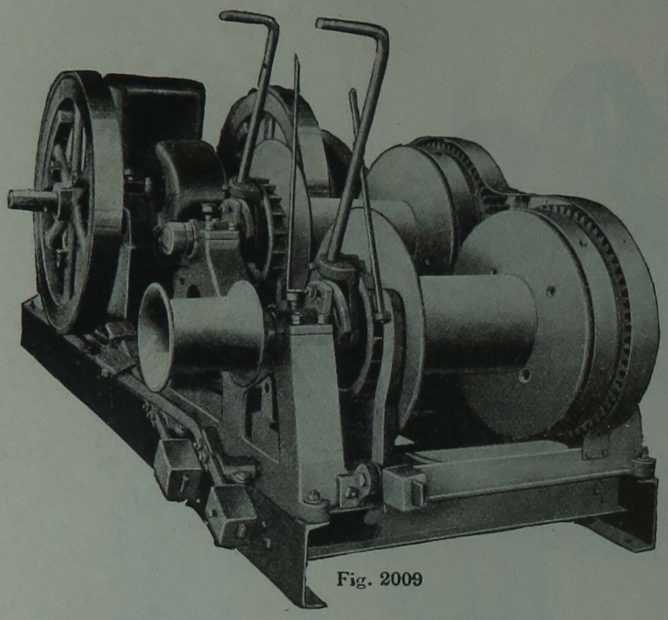


Fig. 2009

Heavy Duty Double Drum Geared Hoist with Vertical Gasoline Engines

TYPE D

For double platform elevator work, bridge building, steel construction work, pile driving, the operation of derricks and concrete buckets, log loading and decking, pulling cars up incline, dreg line work, loading and unloading freight, ships, quarries, etc., these Hoists have proven their worth, because of their years of experience, their sturdy construction and other special features.

For easy starting and operating, we furnish as regular equipment our Friction Clutch Engine Gear, which permits the operator to disconnect the power from the Hoist at any time. Both the Double Drum Broom Swinger and the Independent Winch may be attached.

Reversible Hoists are the same as illustrated and described above, with only reversing clutches added, which are operated by a single lever.

Rope sheaves instead of winch head can be furnished,

Capacity: 1500-3000 Lbs.
Engine: 8, 12, 16 H. P.

HAY HOISTS

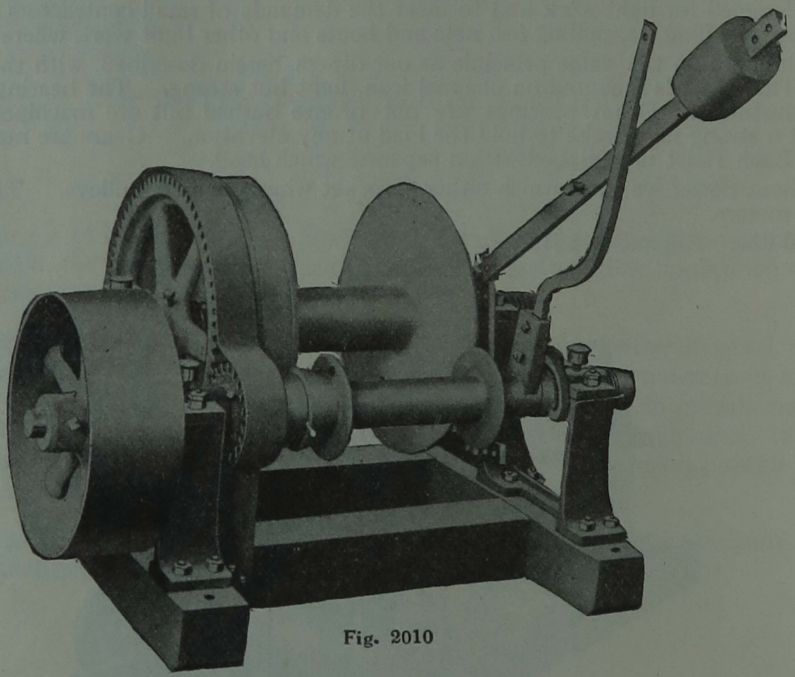


Fig. 2010

BELT DRIVEN—GEARED

The O. K. Geared Hay Hoist was especially designed to save time and labor in unloading and hoisting hay and similar material. To unload hay with the O. K. Hay Hoist, it is used with a regular harpoon fork or sling in connection with track and carrier. It saves one man and team, the man on the load operating the machine by simply pulling a line attached to lever whenever he is ready to hoist. The machine stops hoisting instantly when the lever line is released. The load may be dropped or lowered to any point by pulling slightly on the operating line. By releasing the line altogether the weight on the operating lever will work the brake automatically and stop the hoisting drum, holding the load at desired elevation. To return the fork or sling to the starting point we provide some of the machines with a returning drum. To the operating lever of this drum a line can be attached for operating from a distance the same as the large drum operating lever.

The machine is very easy to operate and is the only machine on the market which is equipped with a powerful automatic brake. The brake is of sufficient strength to brake and hold any load the Hoist will lift, at any height. Should by accident the operating line break in course of lifting, the brake will automatically hold the load suspended. This is an exclusive O. K. feature not found on any other Hoist.

Capacity: 1500 Lbs. Required H. P., 2, 4, 6.

Prices on Application

HOISTS

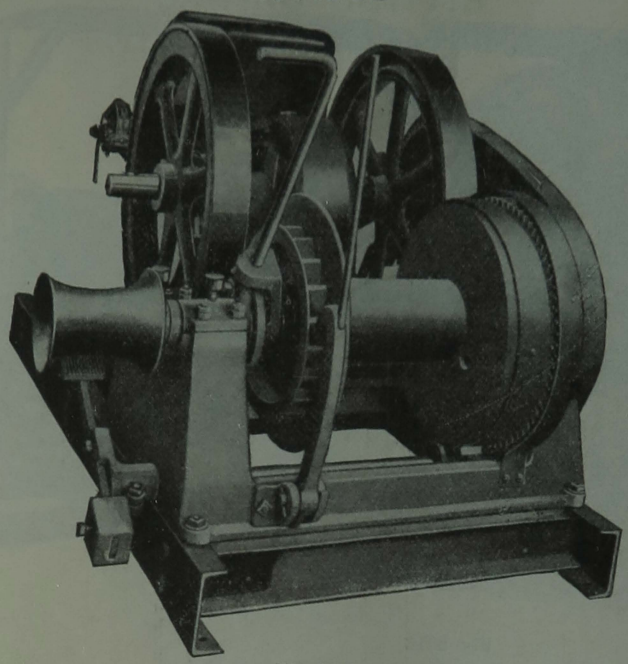


Fig. 2011

Light Duty Single Drum Geared Hoists with Horizontal Gasoline Engines

TYPE J

These Hoists are equipped with horizontal Gasoline Engines, four-cycle type; hopper cooled.

Engine Features: Built in Oscillating Magneto—no batteries, coils, wire, etc. Simple lubricating system. Large crank shaft and adjustable bearings, easily replaced. Throttling governor—steady power.

Capacity, 550–1350 lbs. Engine 4–6 H. P.

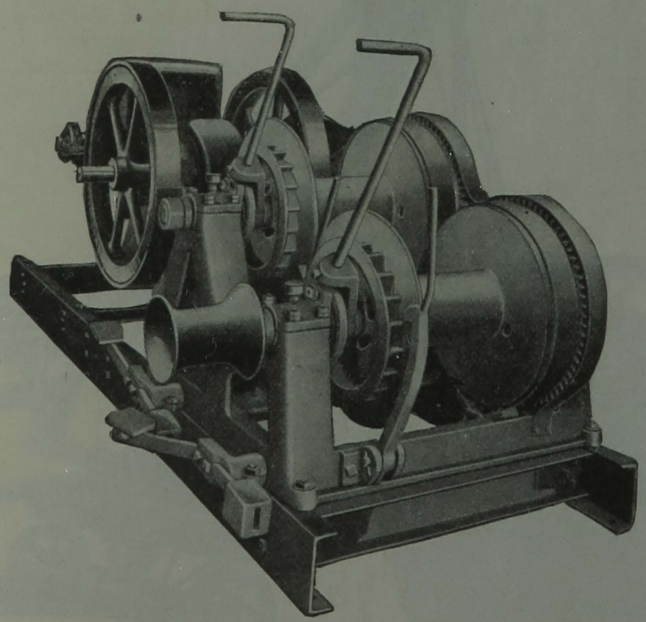


Fig. 2012

Light Duty Double Drum Geared Hoist with Horizontal Gasoline Engine

TYPE JD

For general contracting and building work, the operation of double platform elevators, derricks, loading and unloading of ships, cars, quarries, etc.

Designed the same as our Heavy Duty Hoist only built lighter to meet the demands for a light but efficient Double Drum Hoist.

Webster Oscillating Magnetos are furnished as regular equipment.

Both the Double Drum Boom Swinger and the Independent Winch may be attached to these Hoists.

Capacity, 950-1350 lbs. Engine 4-6 H. P.

Prices on Application.

FAIRBANKS BULLDOG BATCH MIXERS

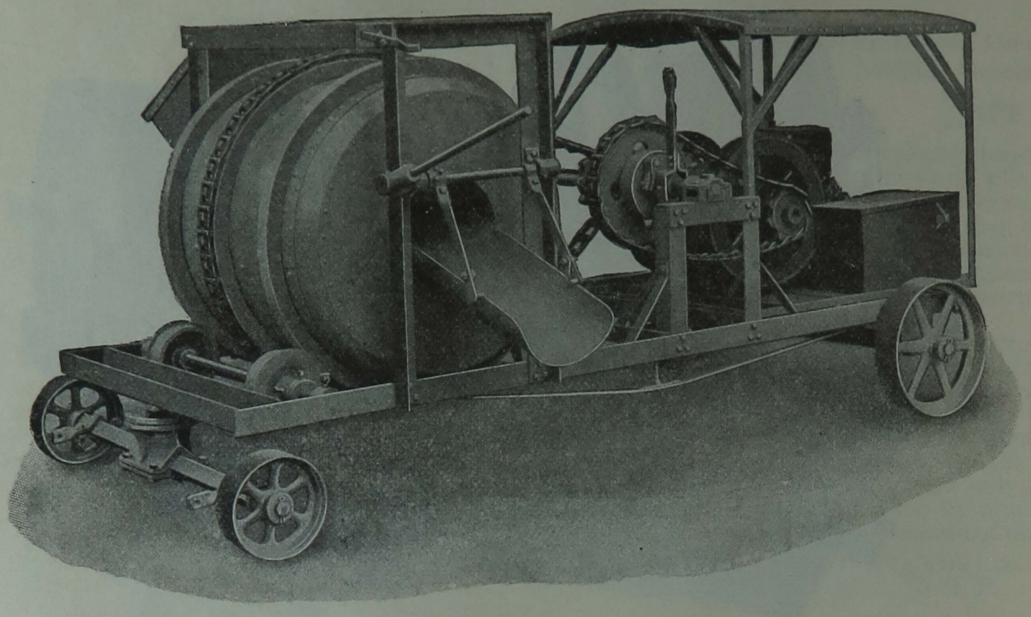


Fig. 2013

Bulldog Junior. 6 Cubic Feet. Dry Mix

The "Bulldog" Batch Mixer is backed by the Fairbanks O. K. It is built on the well established, practical lines of concrete mixer construction. The design is rugged and simple. It combines quality and efficiency. These mixers operate at high speed, mix perfectly and produce perfect incorporation of materials.

The life of a concrete mixer, assuming proper care, depends mainly on the structural endurance of the mixer body. If many of the parts are easily worn out, damaged or broken, a new machine will soon be required.

The dogged endurance of the Fairbanks "Bulldog" Mixer is due to its sturdy, compact construction and the quality of its workmanship and materials. It lasts a very long time.

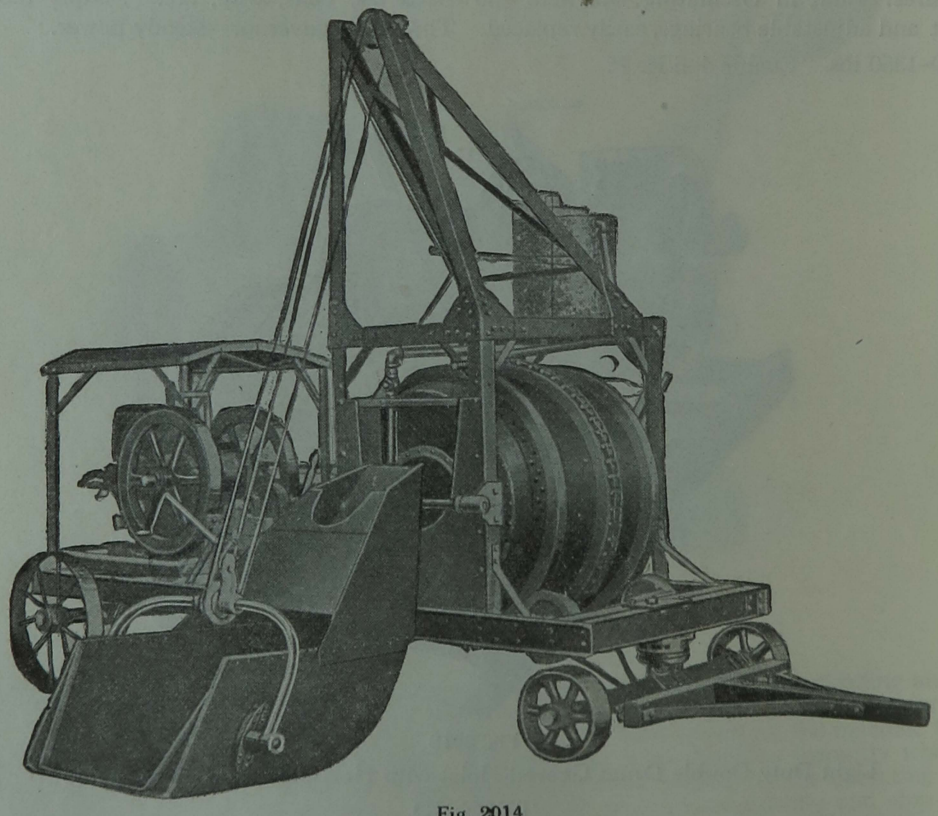


Fig. 2014

Bulldog. 12-20-30 Cubic Feet. Dry Mix

In buying a dependable mixer, these six important requisites should be given careful thought and applied separately to the machines considered: **Strength, Correct Principle, Adaptability** to your work, **Dependability, Simplicity** and **Right Price.**

The Fairbanks "Bulldog" line of mixers gives contractors good dependable guaranteed machines. The investment is so small that part of the profits from a fair-sized job will pay for the whole outfit.

Send for Special Descriptive Bulletin

SAWING OUTFITS

"BULLDOG"—PORTABLE WOOD SAWS

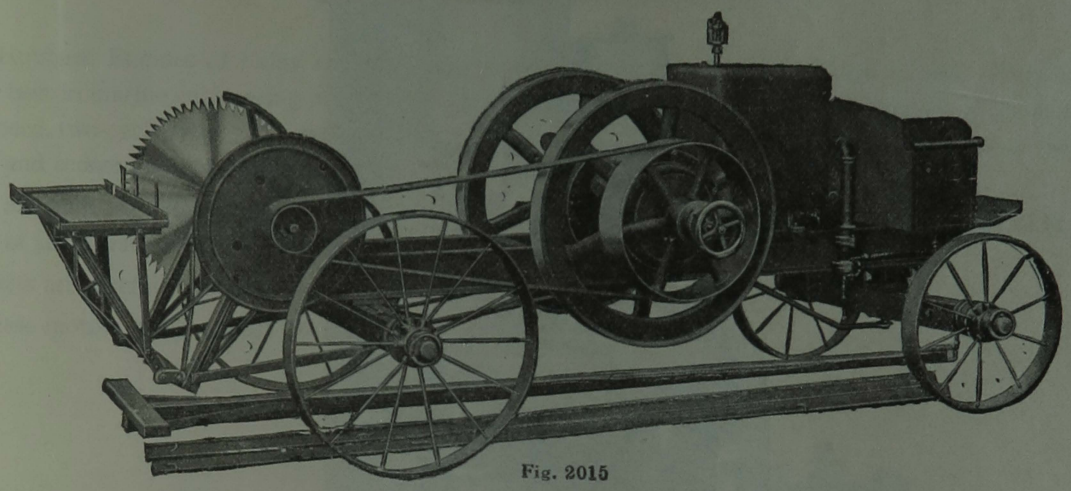


Fig. 2015

4, 6, 8, H. P.

SPECIFICATIONS

Truck for, H. P.	4	6	8
Front wheels, inches	26x4	26x4	26x4
Rear wneels, inches	34x4	34x4	34x4
Capacity, lbs.	3000	3000	4000
Channels	6″x2″x10′	6″x2″x10′	6″x2″x10′
Wheel base	7′ 10″	7′ 10″	7′ 10″
Shipping weight, complete, lbs.	1800	2200	2700
Diameter of saw arbor, inches	1½	1½	1½
Saw pulley, inches	6x6	6x6	6x6
Diameter of saw, inches	26	28	28

"BULLDOG"—CIRCULAR WOOD SAWS

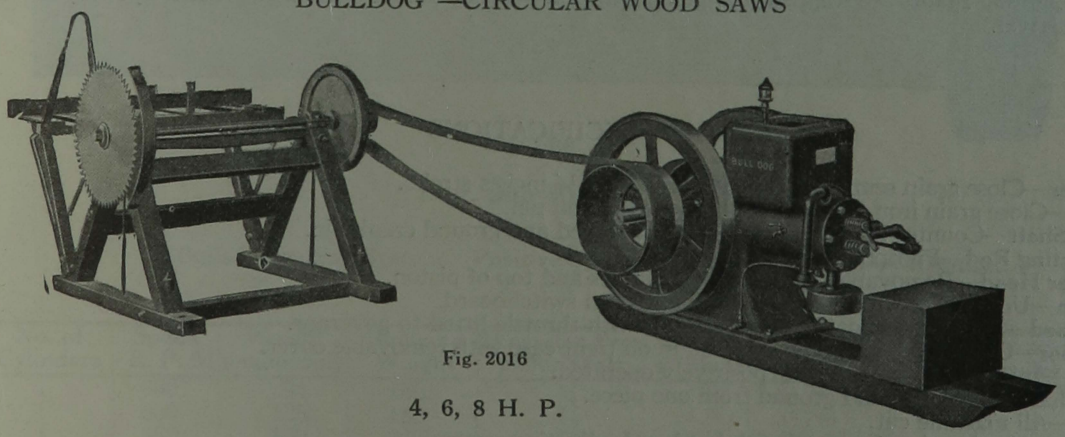


Fig. 2016

4, 6, 8 H. P.

SPECIFICATIONS

Engine, H.P.	4	6	8
Diameter of saw, inches	26	28	28
Bore of saw, inches	1¼	1¼	1¼
R. P. M.	1125	1125	1200
Diameter of saw pulley, inches	6x6	6x6	6x6
Saw mandrel, inches	1½x52	1½x52	1½x52
Distance between saw and flywheel, inches	42	42	42
Shipping weight, complete, lbs	1210	1610	2260

Quickly and easily erected. Engine may be used to drive other machines within its capacity. A very practical combination.

UNIT LIGHTING PLANTS

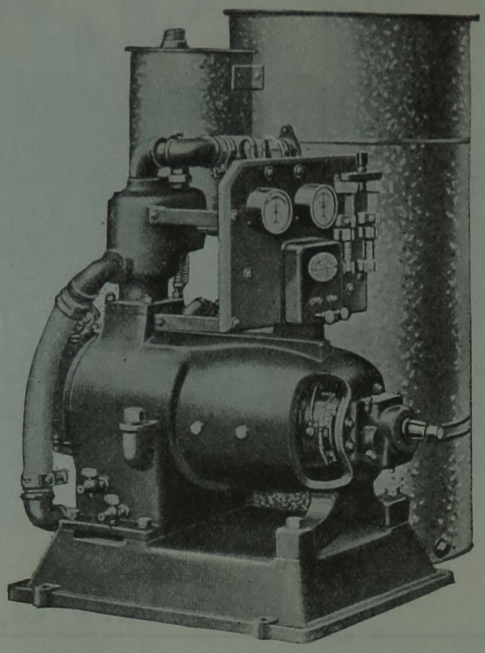


Fig. 2017

DEPENDABLE—ECONOMICAL—CONVENIENT—COMPLETE

Universal 75 light Unit—a practical, thoroughly efficient, light and power plant in the most compact form possible. In this plant a one cylinder gasoline engine is directly connected to a 4-pole electric generator with an 80 ampere storage battery. The engine is started by the turning of a switch and stops automatically when the storage battery is fully charged. The switchboard is automatically controlled. Batteries, engine and switchboard instruments are all of the most efficient type. Power can be taken direct from the generator instead of from batteries if necessary for emergency service and if you have a number of lights on, you can operate milking machine, washer or other machinery without drawing current from the storage battery.

These Lighting Plants are shipped, complete, with full instructions for operation, practically ready for use immediately after arrival.

SPECIFICATIONS

Cylinder—Close grain semi-steel, 2⅝ inches bore, 3½ inches stroke.
Piston—Close grain iron, 3 rings and hardened piston pin.
Crank Shaft—Counter balanced crank with hardened and ground crank pin.
Connecting Rod—Phosphor bronze.
Cylinder Head—Removable, exposing both valves and top of piston.
Ignition—Unisparker with 30 volt coil mounted on switchboard.
Fuel Feed—High grade float feed Carburetor with throttle fitted to governor.
Governor—Centrifugal ball type enclosed in oil tight case with removable cover.
Valves—Inlet and exhaust valves positively operated.
Cam Shaft—Hardened and ground from one piece.
Gears—All machine cut.
Tappets—Hardened and ground with hardened adjusting screws.
Speed—Approximately 1300 R. P. M.
Battery—30 volt, 80 ampere hour.
Dimensions—Height 38 inches, width 20 inches, length 30 inches, weight 900 pounds complete.
Lubrication—Splash system with automatic oil supply. No oil or grease cups, oil float gauge shows height of supply in base.
Generator—Four pole, especially wound for battery charging or operating direct, ball bearing armature shaft.
Switchboard—Mounted on generator with cutout, starting and stopping switches and instruments.
Cooling—Thermo syphon circulation tank.
Sub-Base—Substantial sub-base, with three point support.

We supply plants from 500 Watt to 200 KW.

Our Lighting Plants have made good in the telling test of extended service. They have been manufactured for many years and Uncle Sam has put his O. K. on them by purchasing more than a thousand Units for Government use.

MARINE MOTORS

TWO CYCLE—GASOLENE OR KEROSENE

The Hubbard Engines of today embody many improvements over their previous models. They represent the latest and best in marine engineering practice, and are of well-known quality and workmanship, of the medium weight, medium speed, two-cycle type. The wonderful success of these motors for the past fifteen years is due to their simplicity, reliability and economical consumption of fuel.

They are built for long, hard service, in a modern plant, devoted exclusively to the manufacture of Marine motors and made of the finest material and workmanship.

All parts are carefully made in jigs and fixtures and are interchangeable.

All these motors carry a most liberal guarantee.

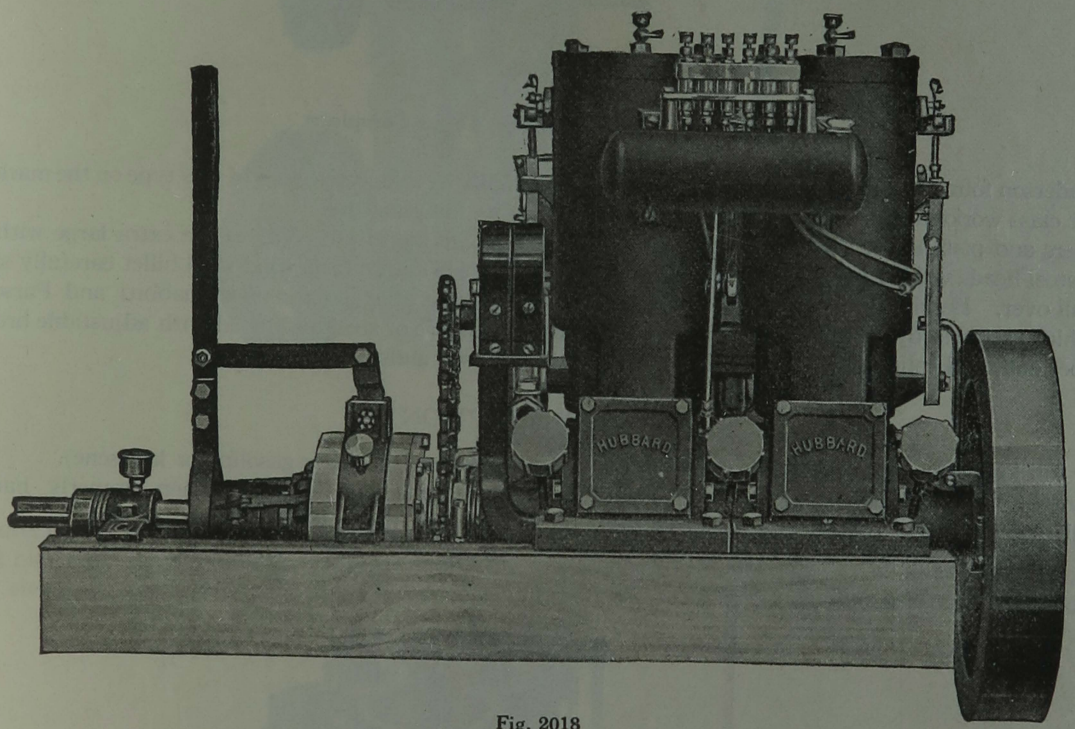


Fig. 2018

15 H. P. with Magneto

Built-in Ignition System. Positive Starting—No Batteries or Coil Required

Horse Power	No. of Cylinders	Speed R. P. M	Weight engine only	Shipping Weight	Diameter Propeller Shaft	Length of Shaft	Bore Stroke	Diameter standard Propeller	No. of Blades
1½	1	650	94	160	¾	4 ft.	3½x3½	12	2
2½	1	600	125	183	⅞	4 ft.	3¾x4	13	2
3	1	550	180	240	⅞	4 ft.	4 x4¼	14	2
4	1	525	210	280	1	5 ft.	4½x5	18	2
5	1	475	275	335	1⅛	5 ft.	5 x5½	18	3
7	1	400	425	515	1¼	6 ft.	6 x6½	22	3
10	1	350	600	700	1⅜	6 ft.	7 x7½	24	3
7	2	550	361	443	1⅛	5 ft.	4 x4¼	18	3
9	2	525	400	500	1⅛	5 ft.	4½x5	20	3
11	2	450	500	650	1¼	6 ft.	5 x5½	22	3
15	2	425	700	850	1⅜	6 ft.	6 x6½	26	3
25	2	350	1100	1362	1⅝	6 ft.	7 x7½	30	3
40									

Send for Special Descriptive Bulletin

MARINE MOTORS

FOUR CYCLE—GASOLINE OR KEROSENE

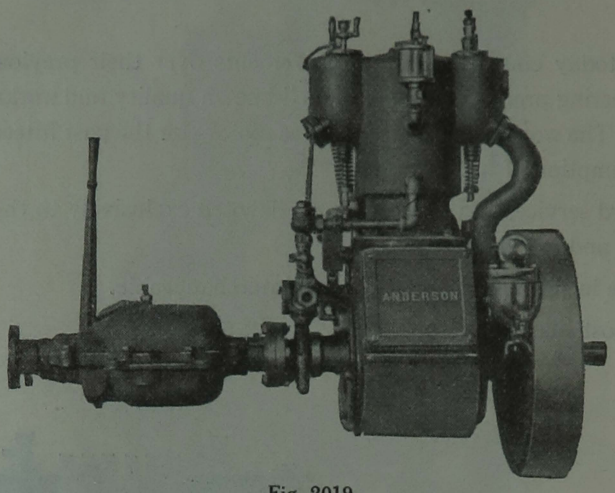


Fig. 2019

4 H. P. Single Cylinder, 4½x5 Complete

The Anderson four-cycle marine engine is one of the most highly developed engines of this type on the market to-day. The highest class workmanship and material is incorporated in its manufacture.

Cylinders and pistons are made of a special mixture of close grained iron. Valves are extra large with cast iron and nickel-steel heads welded to machine steel stems. Crank shaft is forged from solid steel billet carefully slotted and machined all over. Bearings are extra long and fitted with interchangeable genuine nickel babbitt and Parson's white bronze bushings scraped by hand to a perfect fit. Connecting rods are of steel and fitted with adjustable bronze bushings at upper end, and split Parson's white bronze bushings on lower ends.

FUEL CONSUMPTION

Under full load one gallon per horse power in ten hours is consumed (either gasoline or kerosene).

Guarantee: All Anderson Engines are guaranteed to give perfect satisfaction when properly handled, and factory will replace, free of charge, any defective parts returned inside of one year from date of selling.

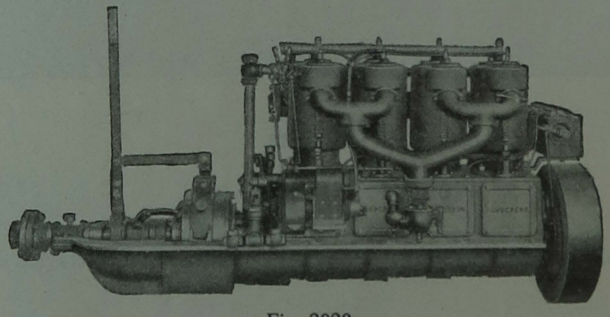


Fig. 2020

50 H. P. Four Cylinder, 7x8½

GENERAL DIMENSIONS, WEIGHTS, ETC.

H. P.	No. Cyls.	Bore & Stroke	R. P. M.	Net Weight	Export Weight	Cubic Feet	Propeller	Shaft
4	1	4½x5	550	400	500	16	15x20	1 x6
8	2	4½x5	550	550	650	20	18x20	1⅛x7
12	2	5 x6	500	1000	1200	33	20x25	1¼x8
24	4	5 x6	500	1600	1800	43	24x30	1½x8
50	4	7 x8½	450	2900	3200	80	32x40	2 x10
100	4	9¼x11	400	6800	7400	200	44x44	3 x12

Send for Special Descriptive Bulletin

MARINE ENGINES

HEAVY OIL TYPE

Absolute dependability in continuous heavy service and maximum economy are prerequisites in industrial stationary and heavy duty marine engines. Years of experience in all parts of the world have demonstrated this **oil engine** perfectly dependable for such service with an economy unparalleled.

ECONOMY

Compared to the cost of running gasoline-kerosene engines, this **Marine Oil Engine** will save its cost within the first year's service. It not only burns fuel less than one-half as expensive, but the amount consumed represents a saving of about one-half in quantity.

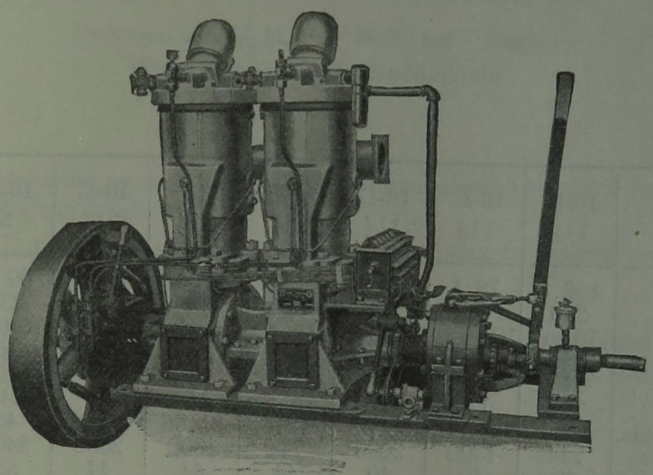


Fig 2021

Type FMX

Therefore, the actual saving in fuel cost averages three to five times the cost of operating gasoline-kerosene engines. In fact, the high cost of gasoline practically prohibits the use of gasoline engines for heavy duty marine service. The saving over steam engines is still more pronounced, to say nothing of the saving in cargo space, cost of attendance, etc.

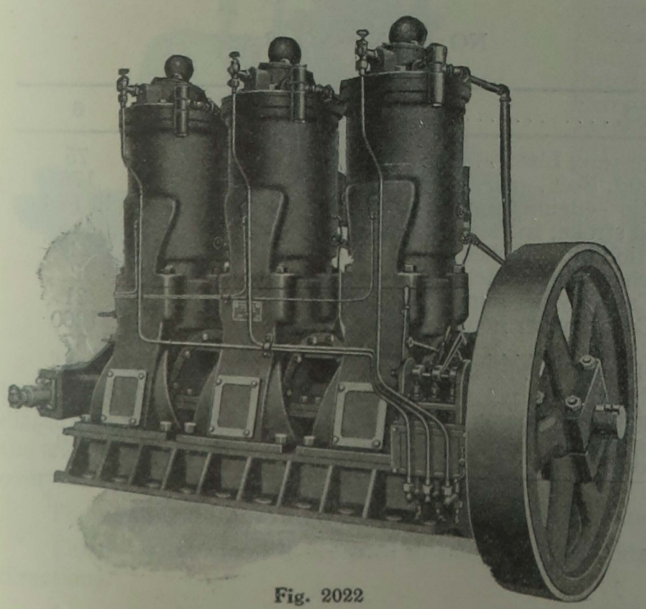


Fig. 2022

Type IMX

SPECIFICATIONS

Type	H. P.	R. P. M. Min.	R. P. M. Nor.	R. P. M. Max.	No. Cyls.	Aprox. Wght.
EM	10	200	420	450	1	950
FM	15	200	350	400	1	2250
DM	20	200	350	400	1	2500
FMX	30	200	350	400	2	3380
DMX	40	200	350	400	2	3950
DMY	60	200	350	400	3	4800
IMX	80	325	150	275	3	7900
IMY	125	325	150	275	3	11500
IMZ	170	325	150	275	3	15600

PISTON PUMPS

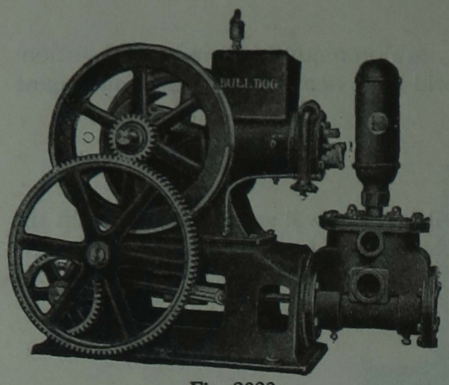


Fig. 2023

STRAIGHT LINE—NO. 10

This pump is designed especially for shifting or for permanent installation requiring a durable outfit to deliver liquid against pressure or head. It embodies the " straight line " principle of construction, by means of which stresses and strains are kept in one plane, avoiding all tendency to twist and spring, as is the case with side crank unit.

The engine and pump are mounted on a strong iron base, making an entirely self-contained unit. The power is transmitted to the pump through suitable gearing, running the pump about forty strokes a minute.

The pump crank and what is known as the "center crank" have two large bearings, one on each side of the rod. The cylinder is brass-lined and the piston is fitted with first quality, double cup leathers.

Outfit NO.	10-B	10-C	10-D	10-E	10-F	10-G	10-H	10-J	10-K	10-L
H. P. Engine	1½	1½	1½	2½	2½	2½	5	5	5	5
Total pressure, Lbs.	108.5	78.1	43.4	141	130	86.8	99.8	73.7	49.9	39
Total head, Feet	250	180	100	325	300	200	230	170	115	90
Gear ratio—engine to pump	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1	10 to 1
Bore and stroke, Inches	3x5	4x5	5x5	3x5	4x5	5x5	5x6	6x6	7x6	8x6
Size suction pipe, Inches	1¼	1½	2	1¼	1½	2	3	3	4	5
Size discharge pipe, Inches	1¼	1½	2	1¼	1½	2	2½	2½	3	4
Rated Capacity per minute, Gals.	12.4	21.66	33.33	12.4	21.66	33.33	40	60	80	100
Rated Capacity per hour, Gals.	744	1300	2000	744	1300	2000	2400	3600	4800	6000
Length, Inches	40	40	40	44	44	44	58	58	62	62
Width, Inches	19	19	19	22	22	22	32	32	32	32
Height, Inches	30	30	30	32	32	32	43	43	43	43
Net Weight, Lbs.	550	550	550	800	800	800	1675	1725	1825	1950
Shipping Weight, Lbs.	650	650	650	900	900	900	1800	1850	1950	2100
Code Word										

ENGINE IS EQUIPPED WITH BUILT-IN OSCILLATING MAGNETO

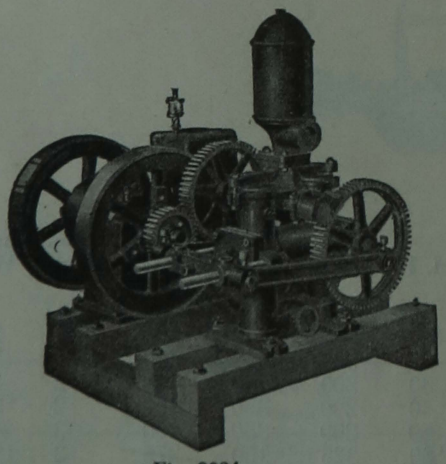


Fig. 2024

NO. 5 AND NO. 6

Outfit NO.	5	6
Total pressure, Lbs.	75	75
Total head, Feet	175	175
Gear ratio—engine to pump	10 to 1	10 to 1
Bore and stroke, Inches	3x5	4x5
Size suction pipe, Inches	1½	2
Size discharge pipe, Inches	1½	2
Rated Capacity per minute, Gallons	12	21
Rated Capacity per hour, Gallons	720	1260
Length, Inches	37	37
Width, Inches	44	44
Height, Inches	43	45
Net Weight, Lbs.	620	865
Shipping Weight, Lbs.	730	975
Code word		

Operated by " Bulldog " Engine

NO. 5, 1½ Horse Power. NO. 6, 2½ Horse Power

DIAPHRAGM PUMP

FAIRBANKS NO. 6

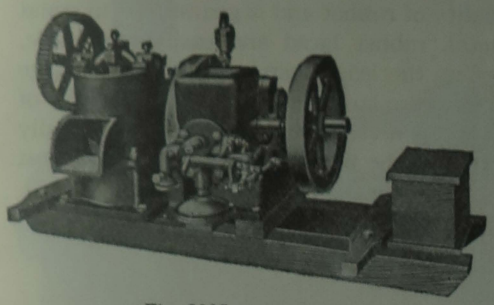


Fig. 2025

Standard Type Diaphragm Pump	3-inch	4-inch
Approximate capacity per hour, 15 Feet lift, Gals.	1800	3500
Length of suction hose, Feet	15	15
Extreme length, Feet	6	6½
Extreme width, Inches	30	32
Net weight with hose, Lbs.	610	720
Shipping weight with hose, Lbs.	700	825

Operated by 1½ H. P. "Bull Dog" Engine
With Built-in Oscillating Magneto

For service where a portable power pump is required, this pump makes an excellent outfit, mounted with our popular Bull Dog Engine on suitable skids or truck.

The pump is geared 5 to 1, and can be direct connected to any engine by gearing proportioned to the speed of the engine.

Note.—This unit can also be furnished with two 3-inch diaphragm pumps mounted on skids or truck and driven by 1½ H. P. Bull Dog Engine—the capacity will be just double. Send for Special Descriptive Bulletin.

Prices on Application

DIAPHRAGM FORCE PUMPS

FAIRBANKS NO. 7

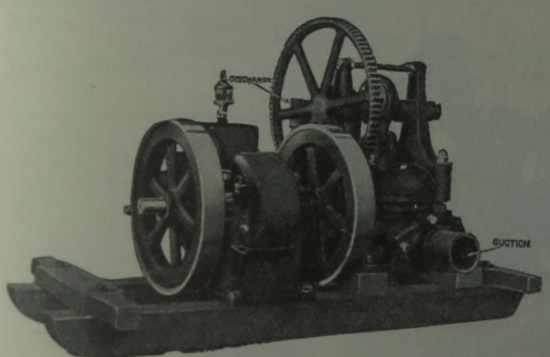


Fig. 2026

Engine H. P.	1½
Skids	4″x4″x5′
Suction	3″
Discharge	3″
Pump Strokes per minute	40
Rated capacity of pump per hour, Gallons	2400
Extreme length	60″
Extreme width	32″
Extreme height	32″
Suction hose	15′
Discharge hose	15′
Net weight with hose, lbs.	740
Approximate shipping weight, lbs.	825

This outfit consists of a new model diaphragm force pump, properly geared to our popular Bull Dog Engine and has been developed to meet the demand for a moderately priced, compact pump good for a force of 15 feet, and the ordinary diaphragm pump suction lift. Its being a force pump makes it especially desirable in that the pump can be placed in the trench or excavation and the water or sewage forced to the top. This feature gives to this unit a decided advantage over the ordinary diaphragm pump.

The pump is fitted with an air chamber to insure a steady flow.

The discharge elbow is designed so that it can be bolted on with the discharge pointing in any one of four different directions.

Prices on Application

DIAPHRAGM SUCTION PUMPS

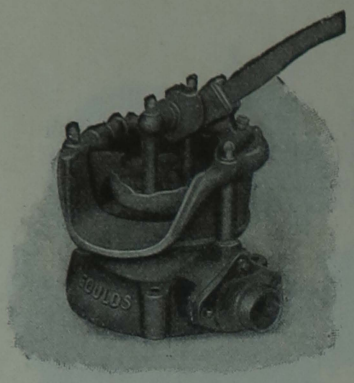


Fig. 2027
Side Suction

Suction hose attachment is at the side cut for iron pipe thread.

The diaphragm is made of the best quality of rubber and is guaranteed to stand hard service. The suction valve of metal, rubber faced and easily removable, rests on an inclined seat and therefore offers the least obstruction to the passage of semi-fluid or solid matter. The waterways are large and permit an easy flow of fluid. The lever is made of wrought iron and is reversible; it can be used vertically or horizontally from either side or the back of the pump. This is the type most widely used by contractors and builders who have to pump out excavations.

NOS.	2	3	4
Stroke, Inches	3	3	4
Suction Pipe, Inches	2½	3	4
Capacity per Hour, Gals.	1800	3500	6000
Weight Each, Lbs.	115	170	256
Each	$.....	.....	.....

Prices on Application

Similar to above, except that the suction pipe connection is made at the bottom instead of the side. This pump is used widely for bilge pumping, but is also suitable for general use of contractors and builders.

NOS.	2	3	4
Stroke, Inches	3	3	4
Suction Pipe, Inches	2½	3	4
Capacity per Hour, Gallons	1800	3500	6000
Weight Each, Lbs.	127	178	266
Each	$.....	.....	.....

Prices on Application

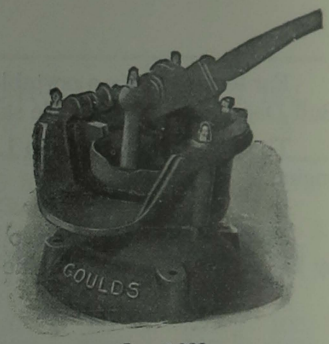


Fig. 2028
Bottom Suction

POWER DIAPHRAGM PUMP JACKS

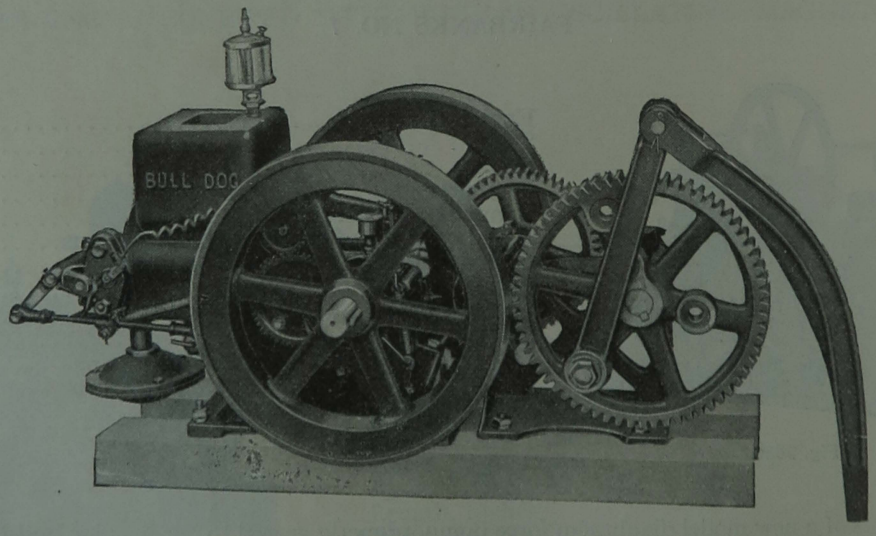


Fig. 2029

Shown connected to "Bull Dog" Engine. Especially adapted for operating diaphragm and bilge pumps.

SPECIFICATIONS

ENGINE								JACK—COMPLETE OUTFIT					
								Dimensions				Weight	
HP.	Bore and Stroke Inches	R.P.M.	Crank Shaft—Size Inches	Crank Shaft—Extends Inches	Exhaust Pipe Inches	Gasoline Capacity Gallons	Back Geared	Stroke Inches	Length Inches	Width Inches	Height Inches	Net Lbs.	Shipping Lbs.
1½	4x4	400	1⅜x24	4½	1	1½	10 to 1	4 and 6	42	24	23	380	425

Price on Application

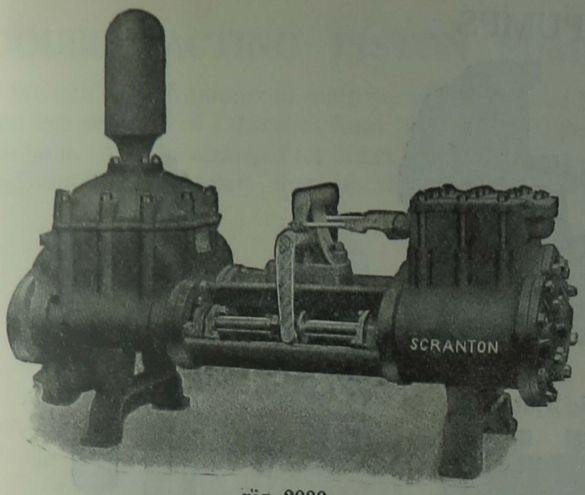


Fig. 2030

STEAM PUMPS

We can furnish single or duplex boiler feed, outside packed plunger, pot valve mine, sinking, tank or light service pumps and receivers, vacuum, general service, hydraulic, fire and for any other service. Prices, bulletins and full information on application.

DUPLEX PISTON STEAM PUMPS FOR TANK OR LIGHT SERVICE SPECIFICATIONS

Diam. Steam Cyl., Inches	Diam. Water Cyl., Inches	Stroke, Inches	Capacity in U. S. Gals. Discharged per Minute	Horse Power of Boilers Pump Will Supply	Steam, Inches	Exhaust, Inches	Suction, Inches	Disch., Inches
3½	2	3	8 to 20	40 to 100	½	¾	1¼	1
4½	2¾	4	20 to 40	100 to 200	¾	1	2	1½
5¼	3½	5	40 to 80	200 to 400	¾	1¼	2½	1½
6	4	6	60 to 100	400 to 600	1	1½	3	2
7½	4½	6	70 to 120	500 to 700	1¼	2	4	3
7½	5	6	80 to 140	600 to 900	1¼	2	4	3
7½	4¾	10	100 to 170	700 to 1000	1¼	2	4	3
8	5	10	120 to 200	800 to 1100	1½	2	4	3
9	5¼	10	130 to 230	1000 to 1200	1½	2	4	3
8	6	10	180 to 300	1200 to 1600	1½	2	5	4
10	6	10	180 to 300	1200 to 1600	1½	2½	5	4

AUTOMATIC FEED STEAM PUMPS AND RECEIVERS

Returns water of condensation to the boiler automatically, from the coils of steam heating or drying systems, etc. The chief economic advantage lies in utilizing the water of condensation while hot, without recourse to a feed-water heater.

Diam. Steam Cyl., Inches	Diam. Water Cyl., Inches	Stroke, Inches	Radiating Surface Drained per Minute, Square Feet	Pipe Sizes			
				Stream, Inches	Exhaust, Inches	Disch., Inches	Inlet to Receiver, Inches
3½	2	3	5000	¾	¾	1	2
4½	2¾	4	12000	¾	1	1½	2½
5¼	3½	5	25000	¾	1¼	1½	3
6	4	6	40000	¾	1½	2	3
7½	5	6	65000	1	2	3	4
7½	4¾	10	80000	1	2	3	4

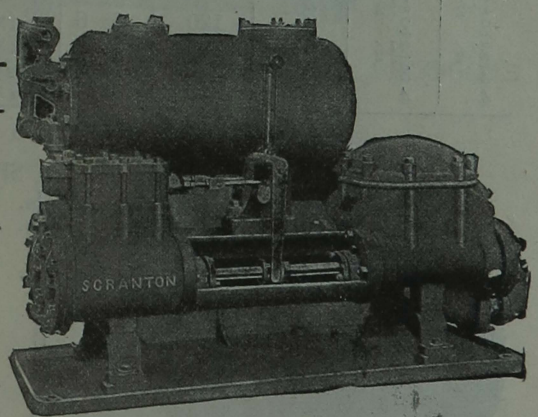


Fig. 2031

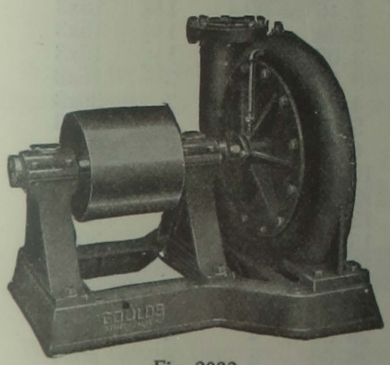


Fig. 2032
Belted Type

CENTRIFUGAL PUMPS

We can furnish standard side suction, vertical, hydraulic, sand, steam driven in single, two or three-stage series. Also volute in both solid and split case, turbine, etc.

Prices, bulletins and full information will be furnished on application

CENTRIFUGAL PUMPS

Fig. 2034

Belt Driven, Vertical, For Pumping from Well or Pit

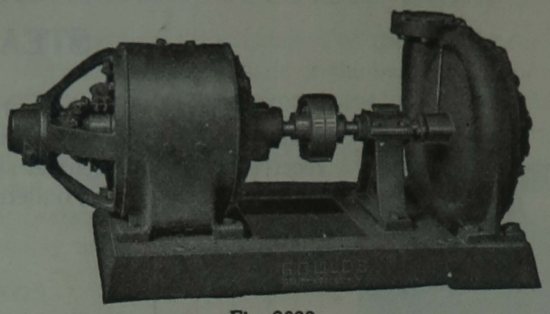


Fig. 2033

Connected to Electric Motor

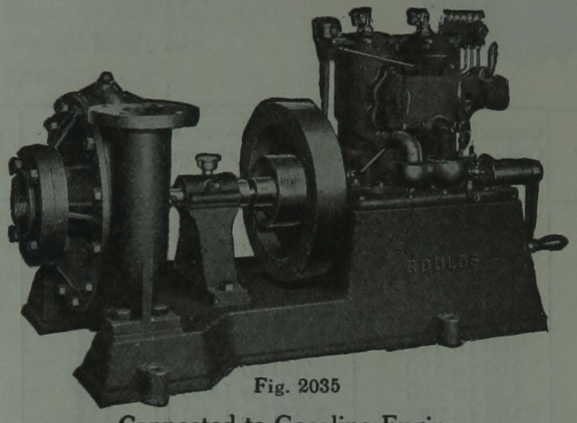


Fig. 2035

Connected to Gasoline Engine

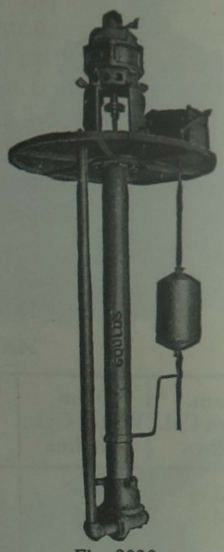


Fig. 2036

Sump Pump, Connected to Vertical Electric Motor for Pumping Out Basement Sumps, Bilges, etc.

GENERAL SPECIFICATIONS, Based on Pumping Clear Cold Water

Pump NOS.	Pipe Size		Nominal Cap. in Gallons per Min.	Diam. and Face Pulley Inches	Floor Space Inches	Shipping Wgt. Lbs.	Pump NOS.	Pipe Size		Nominal Cap. in Gallons per Min.	Diam. and Face Pulley Inches	Floor Space Inches	Shipping Weight Lbs.
	Disch. Inches	Suction Inches						Disch. Inches	Suction Inches				
1	1	1½	30	4x 3	11¼x 9½	35	5	5	6	750	12x12	37¾x33	750
1½	1½	2	70	5x 5	19½x12¾	90	6	6	8	1050	14x14	42¾x37¼	1100
2	2	3	120	6x 6	22¼x16	180	8	8	10	2000	16x14	48 x47	1500
2½	2½	3	200	6x 7	24¾x19	250	10	10	12	3000	18x16	53 x53	2300
3	3	4	270	7x 7	26½x22	375	12	12	15	4200	20x18	58 x59	2800
4	4	5	470	10x10	33¼x29¼	500							

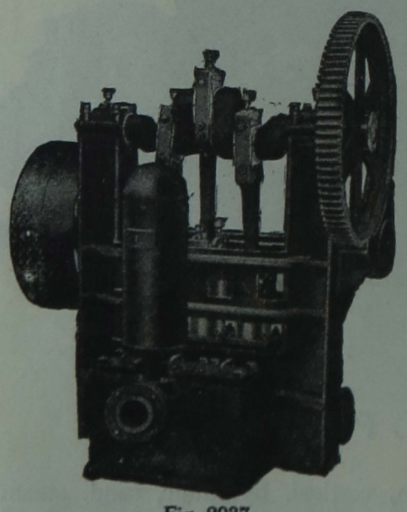


Fig. 2037

We can furnish single and double acting triple pumps with single or double gears for pressures from 40 to 5000 pounds for any service, such as general water supply, municipal water works, fire protection, bailer, tank, mine and oil service, etc.

TRIPLEX PLUNGER PUMPS

SPECIFICATIONS, BASED ON PUMPING COLD WATER

Gals. Disp. per Min.	Size Diam. Ins.	Pump Stroke Ins.	Disp. 1 Rev. of Crank Shaft Gals.	Rev. per Min.	Approx. Horse Power	Suc. Inches	Dis. Inches	Tight and Loose Pulleys Inches
2	1¼	2	0.031	67	.35	¾	¾	12x1½
4	1¾	2½	0.078	52	.64	1	1	12x2½
6	2	3	0.122	50	.96	1¼	1¼	12x2½
6	1¾	2½	0.078	77	.89	1	1	12x2½
9	2	3	0.122	75	1.33	1¼	1¼	12x2½
12	2½	4	0.255	48	1.71	1½	1½	15x3
18	2½	4	0.255	71	2.46	1½	1½	15x3
18	3	4	0.367	50	2.29	1½	1½	15x3
25	3	4	0.367	70	3.07	1½	1½	15x3
25	3½	4	0.501	50	3.07	2	2	15x3
40	4	6	0.978	42	4.60	2	2	20x3
50	4	6	0.978	52	5.65	2	2	20x3
60	4	6	0.978	62	6.72	2	2	20x3
100	5	8	2.041	50	10.60	3	3	30x5
125	5	8	2.041	62	13.00	3	3	30x5
125	6	8	2.938	43	13.20	4	4	30x6
150	6	8	2.938	52	15.80	4	4	30x6
175	6	8	2.938	60	18.30	4	4	30x6
175	7	8	4.000	44	19.00	4	4	36x6
200	7	8	4.000	50	21.30	4	4	36x6
250	7	8	4.000	63	26.00	4	4	36x6
250	7	10	5.000	50	26.60	5	5	36x6
300	7	10	5.000	60	31.30	5	5	36x6

DOUBLE ACTING PISTON PUMPS

We can furnish pumps to meet varied conditions: high and low pressure of capacities from 100 to 10,000 gallon per hour. Can be arranged for direct connection to engine and motor. Particulars on application.

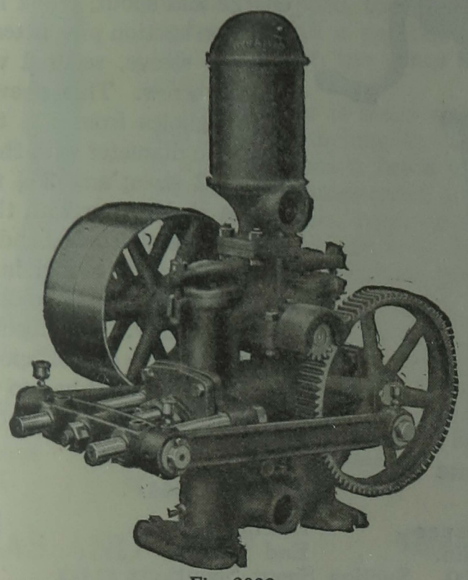


Fig. 2038
Belt Driven

POWER WORKING HEADS

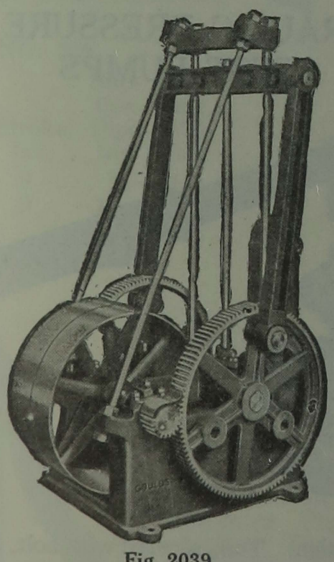


Fig. 2039

With 5 to 24 inch stroke for heads up to 500 feet and displacements up to 250 gallons per minute.

DEEP WELL CYLINDERS

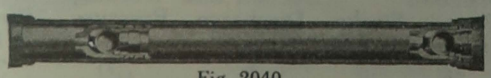


Fig. 2040

We can furnish deep well cylinders of all iron, iron body, brass lined, and all brass to meet varied conditions.

Prices on Application

ROTARY FORCE PUMPS

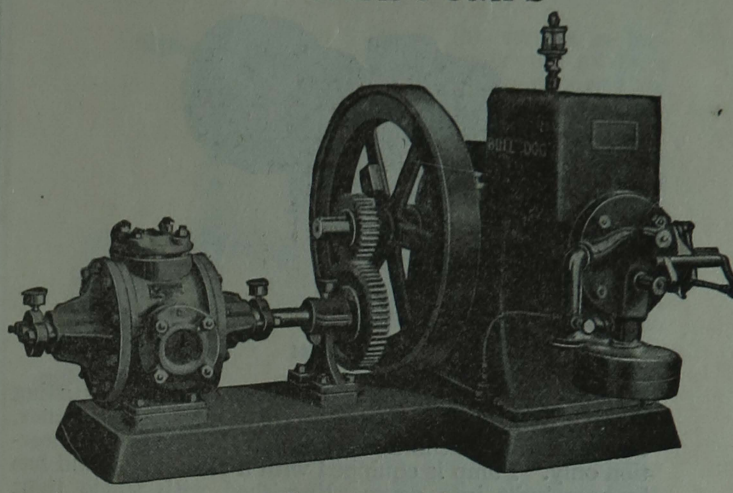


Fig. 2041

OIL STATION, BILGE OR WRECKING PUMPS

50 to 500 Gallons per Minute

We can furnish these units with from one to six pumps mounted on one base and driven from one power unit. Pumps can be operated singly or in multiple. Iron or bronze fitted.

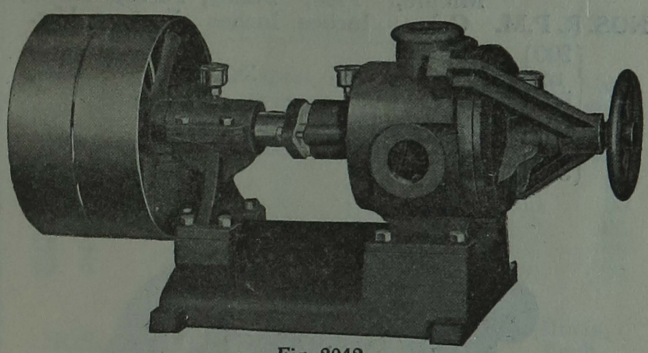


Fig. 2042

SANITARY, CREAMERY OR FOOD PRODUCTS PUMPS

Capacity from 4½ to 80 gallons

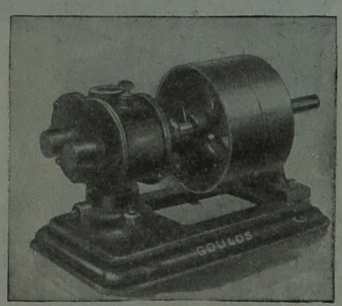


Fig. 2043

Lift and Force, 60 Feet

NOS.	Capacity per Min. 200 Revs., Gallons	Suction Pipe, Inches	Discharge Hose, Inches	Tight and Loose Pulleys, Inches	Approx. Weight, Lbs.
1	20	1¼	1	8x2½	70
2	25	1¼	1	8x2½	75
3	28	1½	1¼	8x2½	84
4	50	2	1½	12x3½	145
4A	50	2	1½	16x3½	161
5	55	2	2	12x3½	154
5A	55	2	2	16z3½	175
6	65	2½	2½	24x4	320

Prices on Application

ROTARY OIL PUMPS

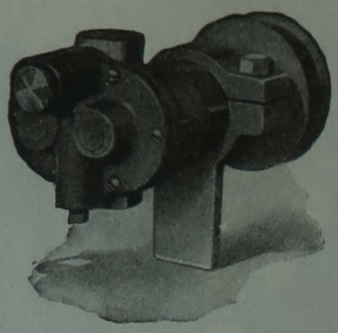


Fig. 2044

Designed for pumping cooling compounds to cutting tools of milling machines, gear cutting machines, lathes, thread cutting machines, etc., which operate in one direction only. Pump is equipped with a relief valve and has by-pass built into cover. Furnished with single tight pulley for belt drive.

TYPE NO. 1676—ONE DIRECTION

NOS.	R.P.M.	Capacity per Minute, Gals.	Suction and Discharge Pipe, Inches	Tight Pulley, Inches	Lift and Force, Feet	Approx. Weight Each, Lbs.
1	200 to 500	1½ to 4	½	3x1	50	10
2	200 to 500	4 to 10	¾	4x1	50	19½

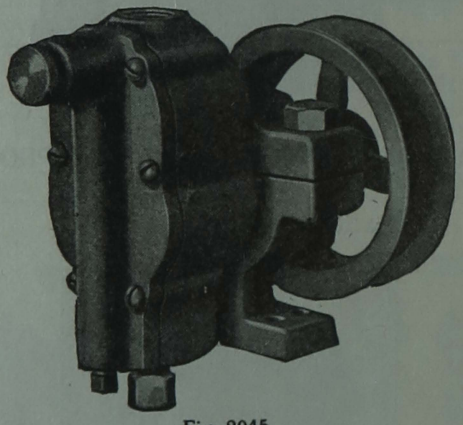


Fig. 2045

Designed for pumping lubricating or cutting compounds to the cutting tools of metal working machines, as screw machines, lathes, bolt cutters and automatic machines that reverse. Equipped with relief valve and by-pass built into the cover. Furnished with single tight pulley for belt drive.

TYPE NO. 1677—TWO DIRECTIONS

NOS.	R.P.M.	Capacity per Minute, Gallons	Suction and Discharge Pipe, Inches	Tight Pulley, Inches	Lift and Force, Feet	Approx. Weight Each, Lbs.
1	200 to 500	.75 to 1½	⅜ or ½	3x1	25	14
2	200 to 500	2 to 5	¾	4x1	25	16

Price on Application

HAND ROTARY PUMPS

Fig. 2046

LIFT AND FORCE
60 AND 100 FEET

A special design for pumping from barrels. It has a top discharge and spout, crank handle and iron suction pipe fitted with a taper sleeve, secured with a thumb screw. This sleeve will fit bungholes from 1⅞ to 2⅞ inches in diameter with the Nos. 1 and 2 sizes; and 2⅜ to 3⅛ inches in diameter with the No. 3 size. The sharpened end of the suction pipe is forced into the wood of the barrel, holding the pump firmly. The pump is furnished with a hook spout and hose couplings. It has no valves. Will lift and force 60 feet.

TYPE NO. 464

NOS.	Cap. per Min. 100 Rev., Gals.	Suction Pipe, Inches	Discharges End Spout Hose, Inches	Discharges Top Spout Hose, Inches	Weight, Lbs.	Iron, Each	Bronze Case and Cans, Each
1	10	1	1	1	41	$17.00	$52.65
2	13	1	1	1	46	19.25	59.40
3	17	1¼	1¼	1¼	53	19.75	66.15

HYDRAULIC PRESSURE OR TEST PUMPS

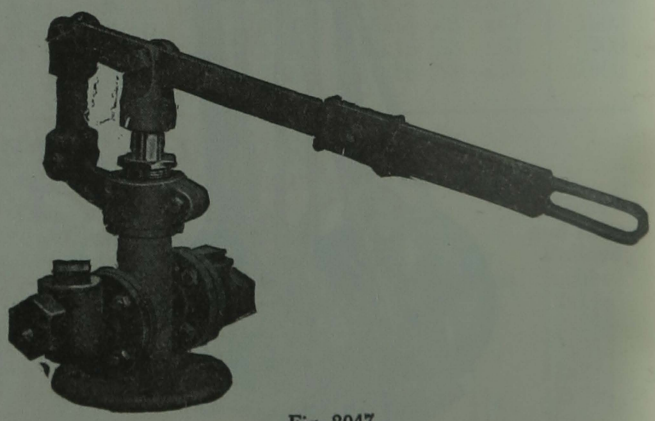


Fig. 2047

Compact design. Top, secured with bolt, can be turned so that the lever can be operated from any position. Suction and discharge valve cases are flanged and bolted to cylinder. Valves, valve seats and caps are brass. Pump should be placed on a level with the water to be pumped or but little above it.

TYPE NO. 867

NOS.	Diameter Piston, Inches	Stroke, Inches	Suction and Discharge, Inches	Working Pressure, Lbs.	Approx. Weight, in Lbs.
0	¾	5	1	700	31
1	1	5	1	550	32
2	1¼	5	1	400	36
5	1½	5	1	200	39

Price on Application

GASOLINE HAND PUMPS

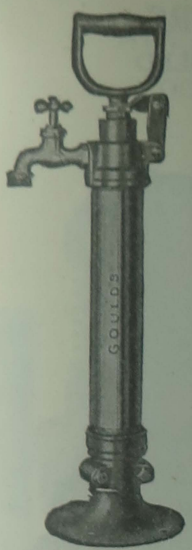


Fig. 2048

This is an inexpensive, well-made hand pump for pumping gasoline from underground storage tanks. By means of the steel locking bar with which the pump is equipped, the plunger rod can be locked with a padlock to prevent tampering with the pump or theft of gasoline.

The cylinder is brass with iron top and bottom attachments. The plunger is iron, and has a brass valve. The plunger rod is brass-cased, and operates through a brass, hemp-packed screw gland. The base is in two parts and is clamped to the suction piece by two bolts.

NO. 1636

Pipe Suction Connections, Inches	Hose Discharge Connections, Inches	Diameter Cylinder, Inches	Stroke, Inches	Capacity per Stroke, Gal.
1	¾	2½	12	.255

GAS AND DRIP PUMPS

For extracting water from gas drip pipes. Cylinder, plunger, valve and glands are of brass, and the plunger rod is brass cased. Suction is regularly fitted for iron pipe unless otherwise ordered.

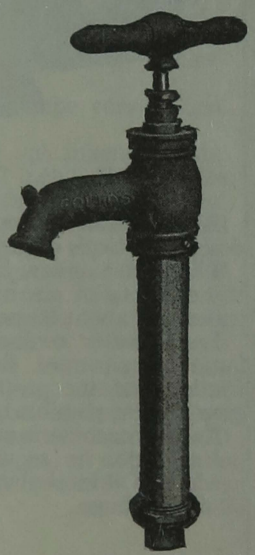


Fig. 2049

NO. 323

NOS.	Diam. Cyl. Ins.	Stroke, Ins.	Suction Pipe, Ins.	Approx. Wgt. Lbs.
0	2	9	¾	11
2	2½	9	1	15

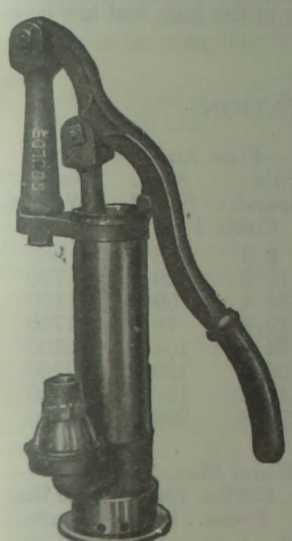


Fig. 2050

PLUMBERS' FORCE PUMPS

Plumbers' Force Pump for removing obstructions. Cylinder and all working parts are brass. Plunger is leather packed. The lever is long, and a high pressure can be easily produced. Discharge is furnished with a brass cased check valve, and fitted for hose coupling. In operating this pump, a hose is connected to pipes to be cleared and pump is set in a vessel of water.

NO. 322

NOS.	Diam., Inch	Stroke, Inch	Cap. per Stroke, Gal.	Discharge Hose, Inch	Approx. Weight, Lbs.
0	2	5	.07	¾	10

Prices on Application

DOUBLE ACTING FORCE PUMPS

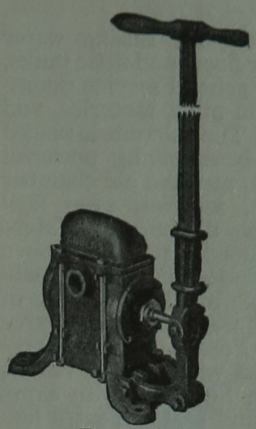


Fig. 2051

Adapted for service in factories, on wharves, as deck pumps, and for pumping to elevated storage tanks for home water supply and fire protection.

Single or double levers for hand power. May also be used as Hand Fire Engines, and for this purpose are mounted on four-wheel trucks.

Suction and discharge regularly fitted for iron pipe, but can be fitted for hose, if so ordered, at extra price.

Piston rod brass-cased; operates through brass packinggland. Valves are brass on brass seats. Cylinders are brass-lined or all brass, as ordered. Discharge is located above suction, making it impossible for air pockets to form.

Can be fitted at extra price with cast bronze cylinder linings, metallic spring or fibrous packed pistons and bronze rods for hot liquids.

Double-Acting Force Pump, as shown in the illustration, fitted with single malleable iron lever and wood handle. Made in five sizes, capacities, 19 gallons to 1.28 gallons per revolution.

SPECIFICATIONS

NOS.	Diam. Cyl. Inches	Stroke, Inches	Capacity per Rev. Gal.	Suction, Inches	Discharge, Inches	*Lift and Force, Feet.	Approx. Wgt. Lbs.
2	2½	4½	.19	1½	1½	150	89
4	3	4½	.28	1½	1½	150	90
8	4	4½	.49	2	2	100	105
12	5	5¼	.89	2½	2½	100	190
16	6	5¼	1.28	2½	2½	100	229

NOS.	Brass-Lined Cylinder, Each	Brass Cylinder, Each	†Brass, Each
2	$30.00	$82.00	$112.00
4	31.00	82.00	112.00
8	34.00	90.00	135.00
12	45.00	135.00	225.00
16	56.00	180.00	275.00

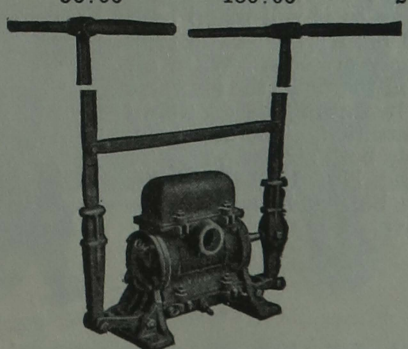


Fig. 2052

Same as above but with two levers and handles

NOS.	Brass-Lined Cylinder, Each	Brass Cylinder, Each	†Brass, Each
8	$40.00	$100.00	$150.00
12	50.00	145.00	230.00
16	60.00	190.00	290.00

*Total Lift and Force from supply to point of delivery. Pump not more than 25 feet above water.

†Brass Pumps are made entirely of brass, except levers, links and bolts.

DOUBLE ACTING FORCE PUMPS

NEW ALERT

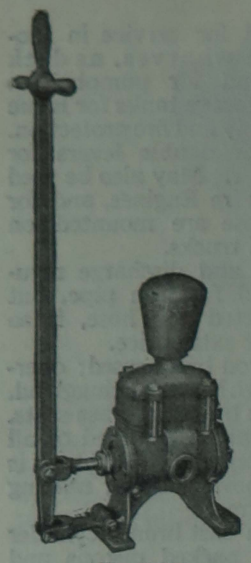


Fig. 2053

Adapted for raising water to upper floors and attic tanks, also for general service pumping, as in mills, factories, and stores. The fulcrum is placed at the base, giving powerful leverage, and the air chamber is large, insuring even flow from the discharge. Valves are grouped in a box above the cylinder, and are easily accessible by the loosening of bolts at the side of the valve box. Pumps are regularly furnished with leather valves, but can be fitted with brass valves and seats at extra list.

Regularly fitted for iron pipe. We can furnish them, however, for lead pipe or for hose, at extra list.

NO. 1334—SPECIFICATIONS

NOS.	Diam. Cyl., Inches	Stroke, Inches	Capacity per Rev., Gallons	Suction Pipe, Inches	Discharge Pipe, Inches
2	2½	5	.21	1¼	1
4	3	5	.31	1¼	1
8	4	5	.54	1½	1¼

NOS.	*Lift and Force, Feet	Approx. Weight, in Lbs.	Iron, Each	Brass-Lined, Each
2	75	65	$16.00	$18.50
4	75	66	18.00	21.00
8	50	91	24.00	28.00

AIR AND WATER FORCE PUMPS

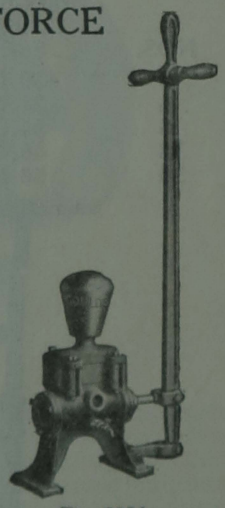


Fig. 2054

This pump is the same as No. 1334, except that it is provided with an air valve so it will pump both water and air for pneumatic tank water supply systems. When air is needed in the tank, the air valve is opened by turning the key shown in the illustration. The pump will then supply both air and water.

By using No. 1613 jack this pump can be readily adapted for power drive.

NO. 1604—SPECIFICATIONS

NOS.	Diam. Cyl., Inches	Stroke, Inches	Capacity per Rev. Gallons	Suction Pipe, Inches	Discharge Pipe, Inches
2	2½	5	.21	1¼	1
4	3	5	.31	1¼	1

NOS.	*Lift and Force, Feet	Approx. Weight, in Lbs.	Iron, Price	Brass-Lined, Price
2	75	65	$20.00	$22.50
4	75	66	22.50	25.00

*Total lift and force from supply to point of delivery. Pump not more than 15 feet above water.

AIR COMPRESSORS

MODEL A—WATER COOLED

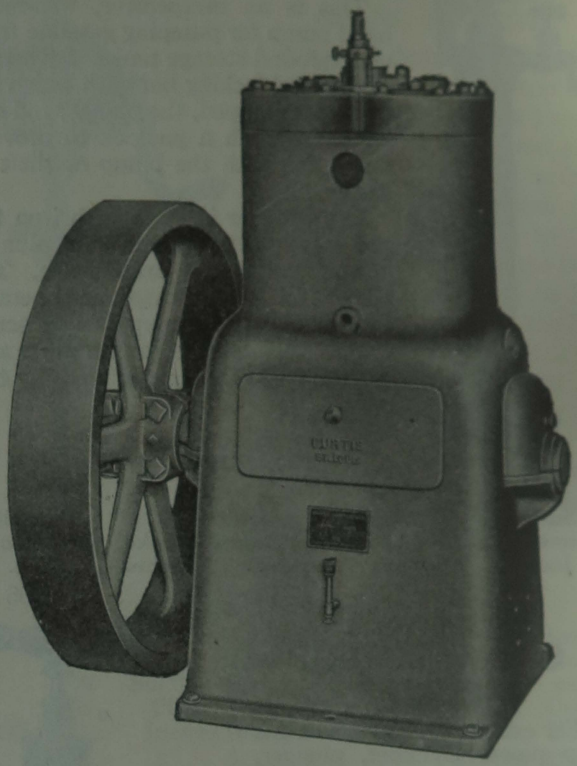


Fig. 2055

All Curtis air compressors are made in the same general design, vertical, single-acting, single-stage compression.

Large port areas, light valves, small clearances bring the capacity of our machines, which can be run at high speeds, to about 95 per cent of piston displacement.

Large water cooling jackets of cylinders and heads, large air passages, light valves, few parts to produce friction and the proper lubrication of all moving parts give highest possible efficiency.

As the machine is automatic and self-oiling, practically no attention is required. A skilled attendant is not needed. Oil level always visible in the high and low level oil filling gauge.

SPECIFICATIONS

Bore and Stroke, Inches	Single or Double Cylinder	R.P.M. St'd	R.P.M. Max	Free Air St'd Speed, Cubic Feet	Free Air Max. Speed, Cubic Feet	Domes. Weight, Lbs.
4½x4½	Single	200	400	8.3	16.6	385
6x6	Single	175	300	17.2	29.5	730
6x6	Double	175	300	34.4	59.0	1100
7x7	Double	160	250	49.9	78.0	1700
8x8	Double	160	225	74.4	104.5	2100
9x9	Double	160	210	106.0	139.0	3200
10x10	Double	160	200	145.5	182.0	4000
12x12	Double	150	190	236.0	298.0	6200

Bore and Stroke, Inches	H. P. at Stand. and Max. Speeds 80 lbs., Press.	100 lbs., Press.	125 lbs. Press.	150 lbs. Press.	200 lbs. Press.
4½x4½	1.58- 3.16	1.67- 3.36	1.86	2.00	2.20
6x6	3.28- 5.60	3.45- 5.90	3.85	4.15	4.50
6x6	6.55-11.2	6.92-11.9	7.7	8.3	9.1
7x7	9.5 -14.9	10.0 -15.7	11.2	12.0	13.1
8x8	14.2 -19.9	15.0 -21.0	16.7	18.0	
9x9	20.2 -26.5	21.3 -28.3	23.8		
10x10	27.7 -34.6	29.3 -36.6	32.6		
12x12	45.0 -57.0	47.4 -60.0	52.8		

AIR COMPRESSORS

MODEL B—AIR COOLED

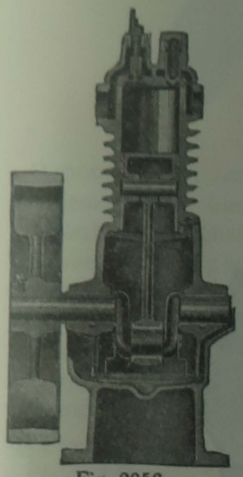


Fig. 2056

Controlled-Splash Self-Oiling System, with cylinder oiling of the controlled splash permanently regulated. Result, no oil gets into the tires to rot them, and the compressor will run ten to fifteen times as long on the same amount of oil as any other splash oiling compressor; one-tenth as much oil used, one-tenth as much attention required.

High and Low Level Oil Filling Gauge, so you can tell at a glance the amount of oil in the crank case.

Fan Fly Wheel assists in cooling the cylinder.

Valves of light weight and large area, inspectable without removing head.

Safety Cage prevents possibility of broken valves dropping and wrecking the machine.

Hand Unloader permits starting against full tank pressure without burning out motor, blowing fuses, burning or jumping of belt.

Large Drop-Forged Crank Shaft. Adjustable, Renewable, die cast non-cutting bearings.

Head Removable without breaking pipe connections. Only one gasket.

For garages up to 15 cars, small vulcanizing plants, or small supply stores, use the 1⅝x2 inch. For garages of 15 to 35 cars, medium size vulcanizing plants and supply stores, 2⅛x2½ inch. For garages of 35 to 60 cars, large vulcanizing plants, or large supply stores, 2½x3 inch. For the average public garage of 60 to 100 cars or for service stations, 3x3½ inch. For garages over 100 cars or very large service stations, 4½x4½ inch.

The following number of 34x4 inch or 30x3½ inch size tires can be completely inflated from flat to the proper pressure with air stored in Curtis standard size tanks at 150 pounds. After this number of tires has been inflated, it will be necessary to pump up the tank from 70 pounds or 80 pounds, as the case may be, to 150 pounds again. A far greater number can be partially inflated, the table is for complete inflation.

Size Tank Air at 150 Lbs. Inches	34x4 Tires to 80 Lbs. Pressure	30x3½ Tires to 70 Lbs. Pressure
10x30	2	4 plus
12x36	3 plus	7 plus
14x48	6 plus	13 plus
16x60	10 plus	22 plus
20x60	16	35

SPECIFICATIONS

Size	1	2	3	4	5
Bore and Stroke	1⅝x2	2⅛x2½	2½x3	3x3½	4½x4½
Minimum Speed	500	400	350	300	250
Cu.Ft.Displace't	1.2	1.8	2.99	4.32	10.4
H.P. at 100 Lbs.	.24	.36	.60	.87	2.09
H.P. at 200 Lbs.		.47	.78	1.14	2.75
Usual Size Motor H.P.	¼	½	¾	1	3
Maximum Speed	700	600	550	500	400
Cu.Ft.Displace't	1.68	2.70	4.7	7.20	16.5
H.P.at 100 Lbs.	.34	.54	.95	1.45	3.34
Size Pulley	9x1¾	11x2⅛	12x2⅛	14x2⅝	22x4½
Shipping Weight	50 Lb.	80 Lb.	100 Lb.	150 Lb.	405 Lb.

Prices on Application

AIR COMPRESSORS

MODEL B—AIR COOLED

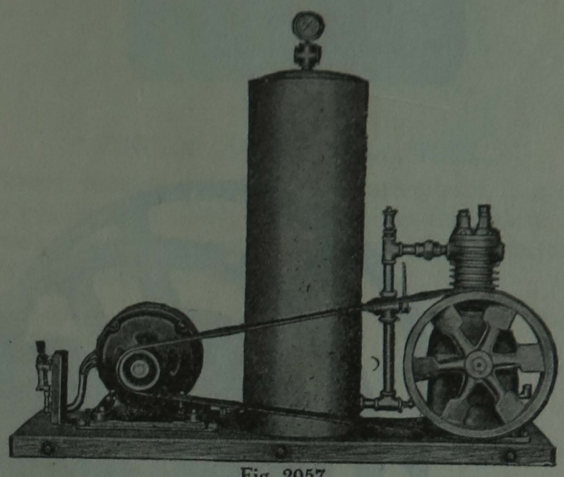


Fig. 2057

STYLE Z, FURNISHED BELTED ONLY

Style and NOS.	Size Compressor Inches	Compressor Speed	Displacement cu. ft.	Maximum Pres. Lbs.	Motor H. P.	Size Tank Inches	Time required to fill t'k from 0 to 150 Lbs. Min.
Z-1-A	1⅝x2	600	1.35	150	¼	12x36	28
Z-2-A	2⅛x2½	500	2.47	150	½	12x36	15
Z-3-A	2½x3	450	3.84	150	¾	14x48	19
Z-4-A	3x3½	400	5.8	150	1	14x48	14
Z-4-B	3x3½	400	5.8	150	1	16x60	23
Z-5	4½x4½	325	13.2	150	3	16x60	8
Z-5-A	4½x4½	325	13.2	150	3	20x60	13

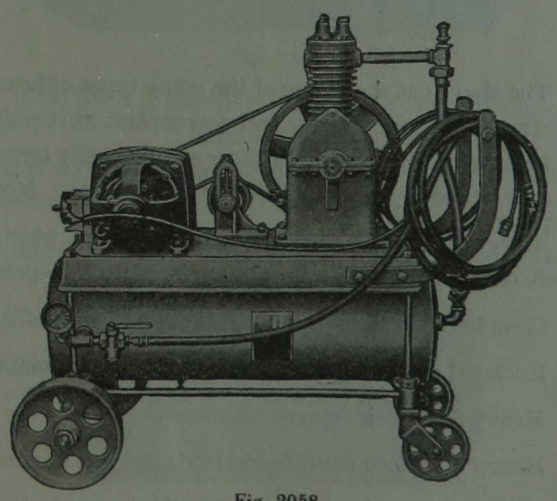


Fig. 2058

STYLE X—FURNISHED BELTED OR GEARED

Style and NOS.	Size Compressor Inches	Compressor Speed	Displacement cu.ft.	Maximum Pres. Lbs.	Motor H. P.	Size Tank Inches	Time required to fill t'k from 0 to 150 Lbs. Min.
X-1-A	1⅝x2	600	1.35	150	¼	12x36	28
X-2-A	2⅛x2½	500	2.47	150	½	12x36	15
X-3-A	2½x3	450	3.84	150	¾	12x36	10
X-4	3x3½	400	5.8	150	1	12x36	8
X-5	4½x4½	325	13.2	150	3	14x48	5

Prices on Application

AIR COMPRESSORS

HEAVY DUTY

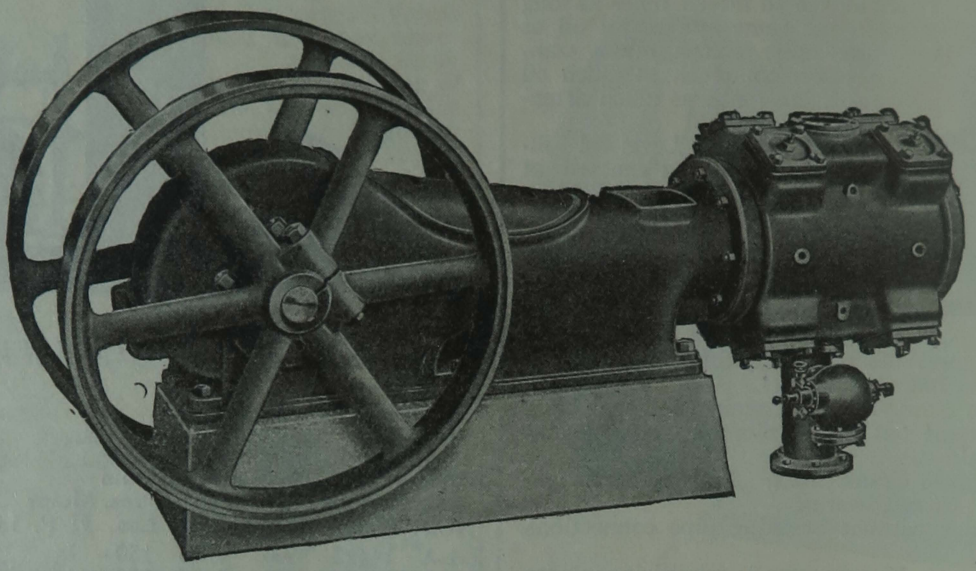


Fig. 2059

The above cut shows one of the many types of heavy duty air compressors that we have to offer. Especially suited to the needs of shop, foundry and power plant as it embodies features of automatism which every user of compressed air will welcome. The bearing surfaces are unusually large and carefully finished. All parts are perfectly fitted and joined, and may be readily adjusted without loss of time. Note following features:

Automatic splash lubrication, by means of which all driving parts are copiously and automatically oiled. The supply of oil is automatically proportioned to the speed at all times.

Complete and liberal water Jacketing insures efficient cooling.

Enclosed construction and removable covers makes for cleanliness and accessibility.

Heavy fly-wheels impart steadiness.

Heavy one piece main frame lends rigidity to entire machine.

Foundation is simple making machine easy to install.

Plate inlet and discharge valves provide for the admission and discharge of the maximum air volumes. They are silent in operation and long lived. Seldom require attention and operate independent of any driving mechanism.

The machine as a whole is automatic in action, requiring minimum care and attention. It occupies but little floor space and may be driven from line shaft, individual motor or gas engine, direct geared or by " short belt " drive.

Send for Special Bulletin and Specifications

WATER HOSE

Fig. 2060

A non-kinking, hard service rubber hose. Made with seamless rubber inner tube; the cotton duck used is thoroughly impregnated with rubber before wrapping on the tube; wrapping is done by automatic machinery, which exerts great pressure, thus giving perfect adhesion of plies; two ply hose listed is for low pressure only; three ply for medium pressure being used mainly for washing and sprinkling purposes; four ply for strong pressures; five and six ply for high pressure.

Size Diam., Inches	½	¾	1	1¼
2-Ply, per Foot	$0.20	.25	.33	.42
3-Ply, per Foot	$0.25	.30	.40	.50
4-Ply, per Foot	$0.30	.37	.50	.62
5-Ply, per Foot	$0.37	.46	.62	.77
6-Ply, per Foot	$0.45	.55	.75	.93

Size Diam., Inches	1½	1¾	2	2¼	2½
2-Ply, per Foot	$0.50	.58	.66	.75	.83
3-Ply, per Foot	$0.60	.70	.80	.90	1.00
4-Ply, per Foot	$0.75	.87	1.00	1.12	1.25
5-Ply, per Foot	$0.93	1.08	1.25	1.40	1.56
6-Ply, per Foot	$1.12	1.30	1.50	1.68	1.87

Size Diam., Inches	2¾	3	3½	4	5
2-Ply, per Foot	$0.92	.99	1.16	1.32	1.65
3-Ply, per Foot	$1.10	1.20	1.40	1.60	2.00
4-Ply, per Foot	$1.37	1.50	1.75	2.00	2.50
5-Ply, per Foot	$1.71	1.87	2.18	2.50	3.13
6-Ply, per Foot	$2.05	2.25	2.62	3.00	3.75

Size Diam., Inches	6	7	8	9	10
2-Ply, per Foot	$1.98	2.31	2.64	2.97	3.33
3-Ply, per Foot	$2.40	2.80	3.20	3.60	4.00
4-Ply, per Foot	$3.00	3.50	4.00	4.50	5.00
5-Ply, per Foot	$3.75	4.38	5.00	5.63	6.25
6-Ply, per Foot	$4.50	5.25	6.00	6.75	7.50

All Intermediate Sizes Charged List Price of Next Larger Size

Furnished in Lengths of 25 and 50 Feet

ARMOURING FOR HOSE

For hose that must stand outside abuse such as dragging over rough floors or use around a boiler room, armours of wire winding or wire braiding can be furnished.

Hose may be wound with round, half-round or flat wire or may be covered with a braided jacket of small round wire.

Size, Inches	3-Ply, Per Foot	4-Ply, Per Foot	5-Ply, Per Foot	6-Ply, Per Foot
½	$0.07	$0.08	$0.10	$0.12
¾	.08	.10	.12	.15
1	.10	.12	.15	.18
1¼	.12	.15	.19	.23
1½	.14	.18	.23	.27
1¾	.17	.21	.26	.32
2	.20	.24	.30	.36
2¼	.22	.27	.34	.41
2½	.24	.30	.38	.45
3	.28	.36	.46	.54

FIRE HOSE

Fig. 2061

SINGLE JACKET MILL HOSE

Strong, durable and absolutely waterproof. It is light and pliable, reels closely and will not sweat or leak, and is well adapted for protection against fires in factories, public buildings, etc.

Size, Inches	1	1¼	1½	2	2½	3
Per Foot	$0.40	.45	.50	.65	.80	1.00

SINGLE JACKET FIRE HOSE

Used by railroads, steamships and towns where a light, durable hose is required.

Takes same list as Single Jacket Mill Hose.

DOUBLE JACKET FIRE HOSE

Made in various sizes and weights, and to perform any kind of fire department, boat or factory service requiring heavy pressure.

2½ Inch Size. Prices on Application

Fig. 2062

COTTON UNDERWRITERS' FIRE HOSE

Rubber Lined

Made to meet the requirements of every fire insurance company operating in the United States.

	Per Foot
2⅝ Inch Waterway, Taking 2½ Inch Couplings	$1.00

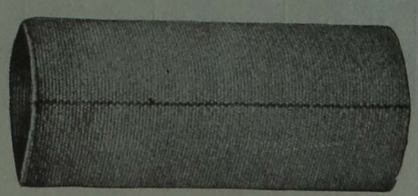


Fig. 2063

LINEN HOSE

Unlined and Seamless

Made strictly to Underwriters' specification.

Unlined linen hose is woven as tight as possible to prevent leakage when water is first let in the hose. As soon as the hose is thoroughly wet the yarns swell and the hose becomes water-tight.

Size, Inches	¾	1	1¼	1½
Per Foot	$0.24	.27	.30	.33

Size, Inches	2	2¼	2½	3
Per Foot	$0.42	.46	.50	.65

SUCTION HOSE

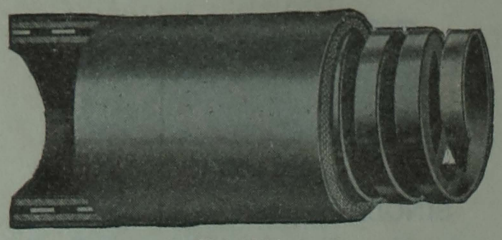


Fig. 2064

SMOOTH BORE

Smooth bore having a pure rubber tube, the wire spiral being imbedded in the wall; used for pumping acids, sand or liquids containing considerable mineral matter, which would cut away a metallic lining.

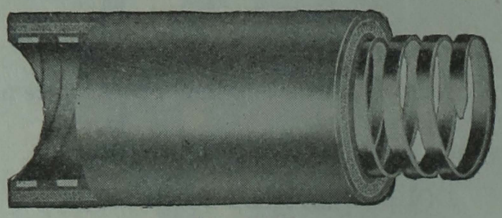


Fig. 2065

WIRE LINED

Wire lined, having no rubber tube or lining; wire is exposed on the inside, although imbedded in hose wall, allowing smooth waterway; used for pumping clear liquids. Wire lining is furnished, either round or flat wire.

Internal Diam., Inches	Smooth Bore, Per Foot	Wire Lined, Per Foot	Brass WireLined, Per Foot	Agricultural, Per Foot
¾	$0.80	$0.70	$0.77	$0.65
1	1.05	.90	1.00	.75
1¼	1.30	1.15	1.25	.93
1½	1.70	1.50	1.65	1.13
1¾	2.15	1.90	2.10	1.31
2	2.60	2.30	2.50	1.50
2½	3.50	3.10	....	1.88
3	4.50	4.00	....	....
3½	5.50	4.90	....	....
4	8.50	5.80	....	....
4½	7.50	8.50	....	....
5	8.50	7.60	....	....
5½	9.50	8.50	....	....
6	10.50	9.50	....	....
6½	12.00	10.50	....	....
7	13.50	12.00	....	....
7½	15.00	13.50	....	....
8	16.50	15.00	....	....
9	19.50	17.50	....	....
10	22.50	20.00	....	....

AIR BRAKE HOSE

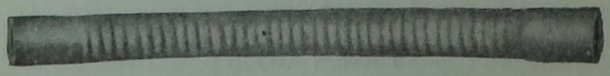


Fig. 2066

With plain or corrugated surface, also furnished armoured if so ordered. Made in lengths of 50 feet, but usually furnished in short sections with capped ends, each piece being branded in any manner desired.

Internal Diam., Inches	½	¾	1	1¼
4-Ply, per Foot	$0.56	.71	.87	1.04
5-Ply, per Foot	$0.70	.87	1.07	1.30

Internal Diam., Inches	1½	1¾	2	2¼	2½
4-Ply, per Foot	$1.25	1.45	1.66	1.87	2.08
5-Ply, per Foot	$1.56	1.81	2.07	2.33	2.60

STEAM HOSE

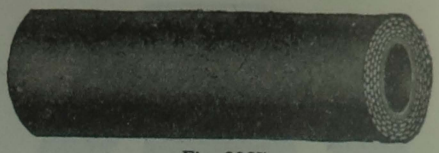


Fig. 2067

Seamless rubber tube, with a woven jacket between outer ply of cotton duck and the outside rubber cover; jacket reduces to a minimum the expansion of hose under pressure so that the adhesion of the rubber uniting the plies is preserved, greatly prolonging the life of the hose. Rubber alone is not a strong steam resister, and must be compounded with proper ingredients to resist severe heat generated; the composition and vulcanizing of this hose enables it to resist high temperatures; weaving of inner covering also increases the flexibility and reduces danger of kinking. Requires no extra covering to add to its strength, other than for external wear, when hose is used in rough places.

Mechanical Rubber Goods Manufacturers' Association List of May 2, 1910

Internal Diam., Inches	½	¾	1	1¼	1½
3-Ply, per Foot	$0.47	.57	.70	.85	1.02
4-Ply, per Foot	$0.56	.71	.87	1.04	1.25
5-Ply, per Foot	$0.70	.87	1.07	1.30	1.56
6-Ply, per Foot	$0.84	1.05	1.28	1.56	1.87
7-Ply, per Foot	$0.98	1.23	1.50	1.82	2.18
8-Ply, per Foot	$1.12	1.41	1.70	2.08	2.50

Internal Diam., Inches	1¾	2	2¼	2½	3
3-Ply, per Foot	$1.18	1.34	1.50	1.66	1.98
4-Ply, per Foot	$1.45	1.66	1.87	2.08	2.50
5-Ply, per Foot	$1.81	2.07	2.33	2.60	3.12
6-Ply, per Foot	$2.17	2.49	2.80	3.12	3.75
7-Ply, per Foot	$2.53	2.90	3.27	3.64	4.38
8-Ply, per Foot	$2.90	3.32	3.74	4.16	5.00

CORRUGATED TENDER HOSE

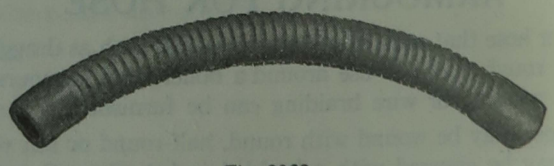


Fig. 2068

An Engine and Tender Hose for connection between tank and boiler injector. This style of hose is made in either straight or curved shape, in lengths as specified. Is corrugated on the outside and has a round spiral steel helix imbedded in the wall. This hose has great flexibility and cannot collapse. An extra heavy rubber cover prevents external damage.

Internal Diam., Inches	2	2¼	2½
3-Ply, per Foot	$0.80	.90	1.00
4-Ply, per Foot	$1.00	1.12	1.25

METALLIC STEAM HOSE

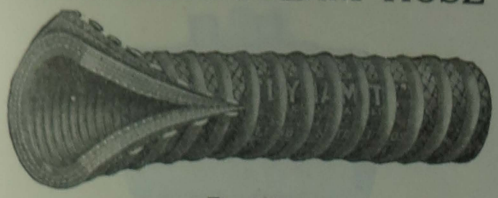


Fig. 2069

For High Pressure and Rough Usage

Thoroughly flexible and suitable for all steam services; spiral wire reinforcement imbedded in inner tube, runs the entire length and prevents either buckling or collapsing. The exterior is protected by two braidings of non-rustible steel wires which completely jacket the hose. Over all is spiraled a concave spring steel wire which cannot crowd or shift and which protects the hose from injury through rough usage.

Size, Inches	½	¾	1	1¼
Per Foot	$0.90	1.10	1.50	1.60

Size, Inches	1½	1¾	2	2½	3
Per Foot	$1.95	2.50	3.00	4.00	5.00

METALLIC AIR HOSE

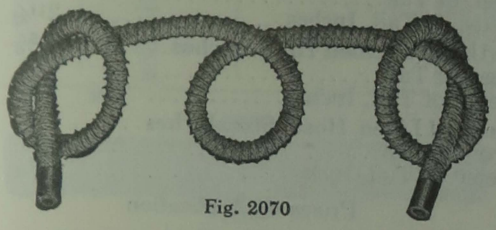


Fig. 2070

Light flexible hose for the highest pneumatic pressures; seamless tube of tough oil-resisting rubber protected by a braiding of steel wires with an armor of hard steel spring wire. This construction prevents kinking and injury from outside abuse and protects the hands of the user.

Size, Inches	¼	⅜	½	¾
Per Foot	$0.30	.39	.46	.57

Size, Inches	1	1¼	1½	2	2½
Per Foot	$0.81	1.16	1.32	1.80	2.50

METALLIC GAS MACHINE HOSE

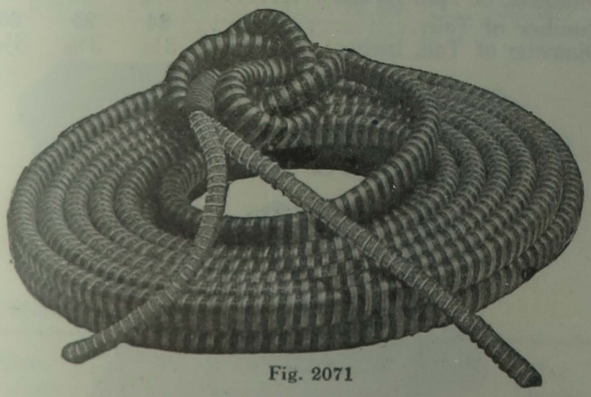


Fig. 2071

For Welding, Cutting and Brazing

Furnished in either single or two-way construction. Hose is made with red and black covers, to distinguish oxygen from gas supply. Covered with a braiding of steel or copper wire and reinforced by a special spiral steel wire; not harmed when it comes in contact with hot metals or sparks and can not become kinked.

Size, Inches	¼	5/16	⅜
Twin, Per Foot	$0.60	.68	.72
Single, Per Foot	$0.30	.34	.36

HOSE COUPLINGS

HIGH PRESSURE

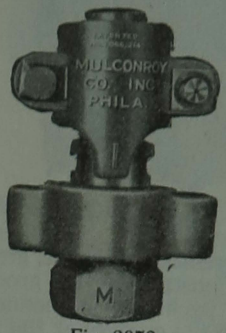


Fig. 2072

FEMALE

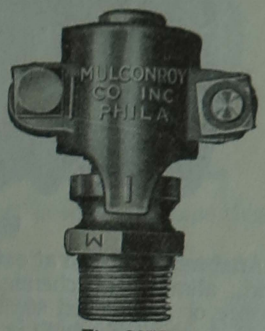


Fig. 2073

MALE

Will fit any standard size hose; suitable for the highest pressures in steam, hydraulic or pneumatic service; made extra heavy of malleable iron; all threads standard iron pipe size.

Size, Inches	½	¾	1	1¼	1½	2	2½
Weight Each, Lbs.	1 5/16	2⅞	3¼	5⅝	5¼	10⅜	20¼
Each	$1.20	2.00	2.00	3.20	3.90	5.00	11.00

Size, Inches	⅜	½	¾	1	1¼	1½	2
Weight Each, Lbs.	¼	11/16	1	1¾	3⅛	3⅜	5¾
Each	$0.75	1.00	1.00	1.00	1.25	1.50	2.00

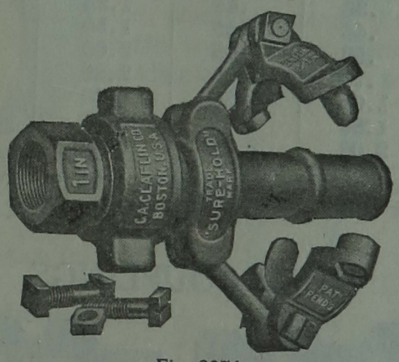


Fig. 2074

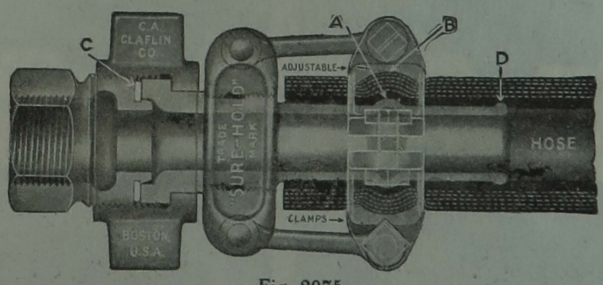


Fig. 2075

SURE HOLD

Unequaled for the highest steam or air pressure common to steam plant, mine, quarry and dredge work. They have been tested to over 1000 pounds hydraulic pressure without sign of hose slipping. If properly attached, it is impossible to blow them off from any hose.

Substantially made from best air furnace malleable iron. Provided with swivel coupling nut and pipe threaded union connection fitted with self-holding metallic gaskets.

For Inside Diam. Hose, Ins.	½	¾	1	1¼	1½
Size Union I.P. Th'd, Each	½	¾	1	1¼	1½
Complete, Each	$1.56	1.84	2.20	3.00	3.60
Extra Union Spuds, Each	$0.40	.48	.56	.76	.92
Extra Union Gaskets, Each	$0.06	.06	.06	.06	.06

ALL METAL HOSE

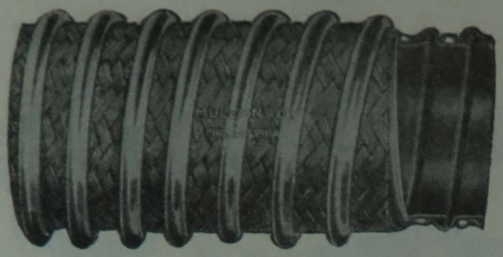


Fig. 2076

Adapted for steam at extreme pressures, oils, fat, grease, acid, alkali and chemicals. Constructed of grooved bronze or galvanized steel tape; packed with chemically treated asbestos, which is fed into the grooves at the time of making; reinforced by bronze or galvanized steel lacing. One end of each length of steam hose is provided with an asbestos and cotton handhold to permit handling of the hose while in use.

Size, Inches	Single Groove	Double Groove		
	Steel, Plain, Per Foot	Steel, Steel-Laced, Per Foot	Bronze, Steel-Laced, Per Foot	Bronze, Bronzelle, Per Foot
1/4	$0.28	$0.35	$0.56	$0.62
5/16	.32	.40	.75	.83
3/8	.36	.45	1.25	1.38
1/2	.44	.55	1.50	1.65
3/4	.58	.85	2.05	2.26
1	.76	.95	2.65	2.92
1 1/4	1.04	1.30	3.20	3.52
1 1/2	1.36	1.70	4.25	4.68
2	2.00	2.25	5.65	6.22

List price of interlocking hose, steel or bronze plain, same as for double groove, steel laced.

HOSE COUPLINGS

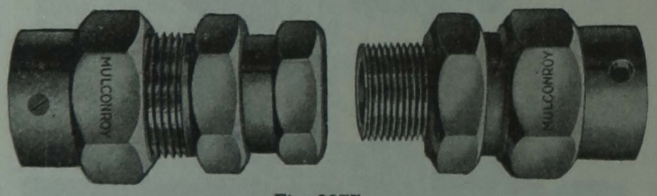


Fig. 2077
Packed for High Pressure

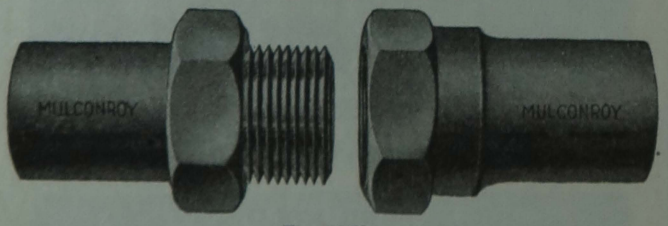


Fig. 2078
Soldered for Low Pressure

Made of extra heavy close texture red brass and attached to the outside of hose. Packed couplings are screwed onto the hose, fitting the grooves in such manner that it is impossible to blow them off. Packed with asbestos and red lead. Soldered couplings are sweated on.

Size, Inches	1/4	3/8	1/2	3/4
Packed, per Set		$3.35	4.00	5.60
Soldered, per Set	$1.70	2.35	2.60	3.00
Size, Inches	**1**	**1 1/4**	**1 1/2**	**2**
Packed, per Set	$7.50	10.00	13.35	17.50
Soldered, per Set	$3.70	4.50	6.00	7.50

EXPANSION RING COUPLINGS

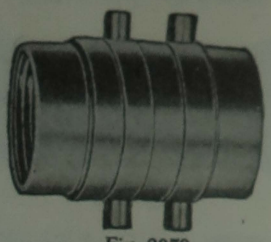


Fig. 2079

MILL

Made for cotton rubber lined mill or unlined linen hose. Attached to the hose by the expansion of a metal band into the swivel. Two expansion rings and a rubber washer are furnished free with each set. In ordering expansion ring couplings it is necessary to specify number of tail piece and kind of thread. If special thread is required a sample thread carefully tagged for identification should be sent with the order.

Size, Rubber Lined Hose, Inches	1	1 1/4	1 1/2
Number of Tail	7	9	11
Diameter of Tail, Inches	1 15/16	1 19/32	1 27/32
Size, Rubber Lined Hose, Inches		2	2 7/8
Number of Tail		12	13
Diameter of Tail, Inches		2 11/32	2 7/8
Sizes, Unlined Linen Hose, Inches	1	1 5/8	1 7/8
Number of Tail	8	10	14
Diameter of Tail, Inches	1 3/16	1 15/32	1 3/4
For Unlined Linen Hose, Size, Inches		2	2 1/2
Number of Tail		15	16
Diameter of Tail, Inches		2 3/16	2 3/4

Prices on Application

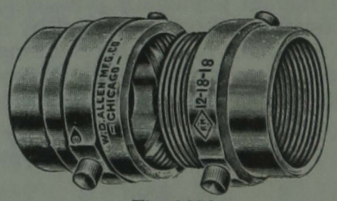


Fig. 2080

UNDERWRITERS'

Made in accordance with the requirements of the inspection department of the associated factory mutual fire insurance companies.

Made in 2 1/2-inch size only.

Number of Tail	21	22	23
Diameter of Tail, Inches	2 3/4	2 7/8	3
Number of Tail	24	25	26
Diameter of Tail, Inches	3 1/8	3 3/16	3 1/4

Prices on Application

COUPLING EXPANDERS

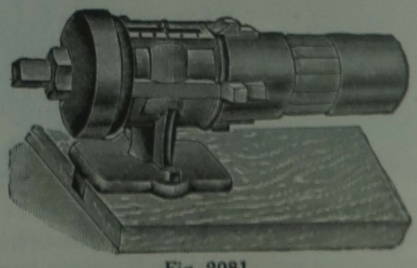


Fig. 2081

AUTOMATIC

These expanders are necessary in attaching automatic and similar couplings to hose. The wearing parts are substantially made and work smoothly.

Made for hose couplings, 1/2 inch to 6 inches.

Prices on Application

HOSE COUPLINGS

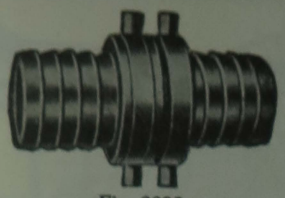


Fig. 2082

For Water Hose

Made of cast brass. Illustration shows style with lugs used on sizes 1¼ inch and larger. Smaller sizes are furnished without lugs.

Size, Inches	Weight Each, Ounces	Hose Thread, Per Dozen	Pipe Thread, Per Dozen
½	3	$2.40	$2.65
¾	3	2.40	2.65
1	3	4.40	4.65
1¼	4½	10.00	10.50
1½	11	14.00	15.00
2	13	24.00	26.00
2½	17	48.00	50.00
3	21	75.00	76.00
3½	26	....	120.00
4	32	....	150.00
5	40	....	250.00
6	49	....	350.00
8	58	....	504.00

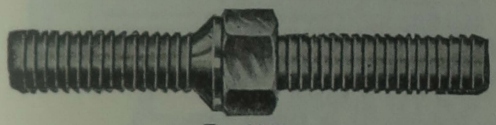


Fig. 2083

For Steam Hose

Size, Inches	Weight Per Dozen, Lbs.	Iron Pipe, Thread, Per Dozen	Female Half, Iron Pipe, Thread, Per Dozen
½	3	$15.00	$10.35
¾	3½	15.00	10.35
1	5	18.00	12.75
1¼	7	24.00	17.00
1½	11	30.00	21.50
2	16	42.00	30.00
2½	20	72.00	50.00

Fig. 2084

Bushing

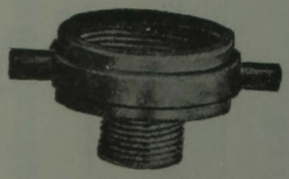


Fig. 2085

Reducer

Polished cast brass.

Size, Inches	Weight Dozen, Lbs.	Per Dozen	Size, Inches	Weight Dozen, Lbs.	Per Dozen
1 x ½	⅛	$6.50	2 x1¼	1	$16.00
1 x ¾	¼	6.50	2 x1½	1	18.00
1¼x ¾	½	8.00	2½x ¾	1	20.00
1¼x1	½	10.00	2½x1	1	22.00
1½x ¾	½	11.50	2½x1¼	1	23.00
1½x1	½	11.50	2½x1½	1	24.00
1½x1¼	½	12.00	2½x2	1⅓	26.00
2 x ¾	¾	13.00	3 x2	1¼	30.00
2 x1	¾	14.00	3 x2½	1½	36.00

HOSE NIPPLES

Fig. 2086

Male

Fig. 2087

Female and Male

When ordering specify whether hose or iron pipe thread is required. Polished cast brass.

Size, Inches	Weight Per Dozen, Lbs.	Per Dozen	Size, Inches	Weight Per Dozen, Lbs.	Per Dozen
½	1½	$3.50	2	4	$14.00
¾	2	3.50	2½	4½	28.00
1	2½	5.00	3	5	40.00
1¼	3	9.00	3¼	5½	50.00
1½	3½	10.00	4	6	75.00

HOSE CLAMPS

Fig. 2088

SURE GRIP

Stamped from one piece of special steel plate galvanized. Full pressure of the bolt may be exerted without buckling or pinching the hose.

Size Hose, Inches	⅜	⅜	½	½	½
No. Plies	2	3	2	3	4
Ins. Dia., Open Ins.	9/16	5/8	¾	⅞	15/16
Per Dozen	$1.00	1.00	1.00	1.00	1.00
Size Hose, Inches	½	⅝	⅝	¾	¾
No. Plies	5	2	3	2	3
Ins. Dia., Open Ins.	1	1	1 1/16	1 1/16	1⅛
Per Dozen	$1.00	1.00	1.00	1.00	1.00
Size Hose, Inches	¾	¾	1	1	1
No. Plies	4	5	2	3	4
Ins. Dia., Open Ins.	1 3/16	1¼	1 5/16	1⅜	1 7/16
Per Dozen	$1.00	1.00	1.50	1.50	1.50
Size Hose, Inches	1	1¼	1¼	1¼	1¼
No. Plies	5	2	3	4	5
Ins. Dia., Open Ins.	1½	1⅝	1 11/16	1 13/16	1⅞
Per Dozen	$1.50	2.50	2.50	2.50	2.50
Size Hose, Inches	1½	1½	1½	1¾	1¾
No. Plies	3	4	5	3	4
Ins. Dia., Open Ins.	2	2⅛	2 3/16	2¼	2⅜
Per Dozen	$3.00	3.00	3.00	3.50	3.50
Size Hose, Inches	2	2	2	2¼	2¼
No. Plies	3	4	5	3	4
Ins. Dia., Open Ins.	2 7/16	2 9/16	2 11/16	2¾	2 13/16
Per Dozen	$4.00	4.00	4.00	5.50	5.50

For Suction Hose

Double bolt galvanized sheet steel. Made in one size only, for 2-inch agricultural Suction Hose, strongest made clamp for this purpose.

Prices on Application

Fig. 2089

HOSE CLAMPS

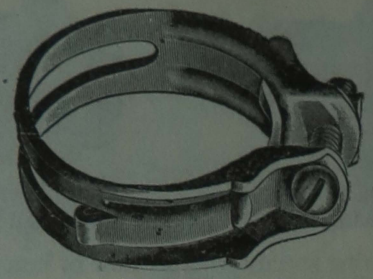


Fig. 2090

Rolled from sheet steel, thoroughly galvanized. Fitted with galvanized round head bolt and nut.

FOR WATER HOSE

Size Hose, Inch	3/16	1/4	3/8	3/8
No. of Plies	..	3	2	3
Inside Dia., Open, Inch	7/16	1/2	5/8	13/16
Per Dozen	$0.60	.60	.60	.60
Size Hose, Inch	1/2	1/2	1/2	3/4
No. of Plies	2	3	4	2
Inside Dia., Open, Ins.	7/8	15/16	1 1/32	1 3/32
Per Dozen	$0.60	.60	.60	.60
Size Hose, Inches	3/4	3/4	1	1
No. of Plies	3	4	2	3
Inside Dia., Open, Ins.	1 3/16	1 1/4	1 11/32	1 7/16
Per Dozen	$0.60	.60	2.00	2.00
Size Hose, Inches	1	1 1/4	1 1/4	1 1/2
No. of Plies	4	3	4	3
Inside Dia., Open, Ins.	1 17/32	1 21/32	1 13/16	1 15/16
Per Dozen	$2.00	2.50	2.50	3.00
Size Hose, Inches	1 1/2	2	2 1/4	2 1/2	3
No. of Plies	4	3, 4	3, 4	3, 4	3, 4
Inside Dia., Open, Ins.	2 1/16	2 9/16	2 14/16	3 1/16	3 15/16
Per Dozen	$3.00	4.00	6.50	7.00	10.00

FOR STEAM HOSE

Size Hose, Inches	3/4	3/4	1	1
No. of Plies	3	4	3	4
Inside Dia., Open, Ins.	1 7/16	1 17/32	1 5/8	1 21/32
Per Dozen	$2.00	2.00	2.50	2.50
Size Hose, Inches	1 1/4	1 1/4	1 1/2	1 1/2
No. of Plies	3	4	3, 4	5
Inside Dia., Open, Ins.	1 15/16	1 31/32	2 7/32	2 13/32
Per Dozen	$3.00	3.00	3.50	4.00
Size Hose, Inches	2	2	2 1/2	2 1/2
No. of Plies	3, 4	5	3, 4	5
Inside Dia., Open, Ins.	2 11/16	2 14/16	1 1/4	3 9/16
Per Dozen	$5.50	6.50	8.50	9.50

HOSE PIPES

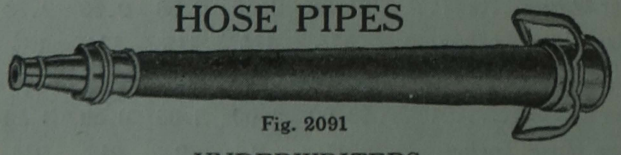


Fig. 2091

UNDERWRITERS

Brass pipe; Marlin wound; painted red.

Conforms to associated insurance companies inspection specifications.

Size, Inches	Length Inches	Weight Each, Lbs.	Each: Wound and Painted	Each: Plain Brass	Each: Rubber Tube, Swivel Handle	Each: Leather Tube, Swivel Handle
2	20	6	$ 9.00	$ 7.50	.....	.....
2 1/2	24	7	11.00	9.50	.....	.....
2 1/2	30	8	12.00	11.00	$15.00	.....
2 1/2	36	10	15.00	13.50	18.00	$18.00

HOSE PIPES

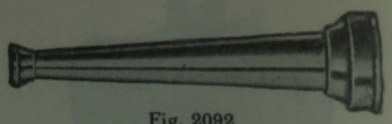


Fig. 2092

PLAIN

Made with seamless brass barrel, either tapered or straight. Unless otherwise specified, tapered barrels will be furnished.

Size, Inches	Length, Inches	Weight Each, Lbs.	Per Dozen: Hose Thread	Per Dozen: Pipe Thread
3/4	3	1/4	$ 4.00	$ 5.00
3/4	6	1/2	7.00	8.00
1	4	5/8	5.00	6.25
1 1/4	4 3/4	3/4	12.00	13.75
1 1/4	12	1 1/4	18.00	19.75
1 1/2	5 3/4	7/8	18.00	19.75
1 1/2	12	1 1/2	22.00	24.00
2	6 3/4	1 1/8	26.00	29.00
2	12	2	34.00	39.00
2 1/2	7 1/2	2 1/2	37.40	39.50
2 1/2	12	4	55.00	60.00
2 1/2	20	5	90.00	92.00

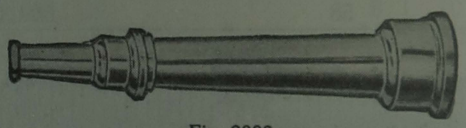


Fig. 2093

SCREW TIP

Pipes are of cast brass, heavy and well finished; plain screw tip.

Size, Inches	Length, Inches	Weight Per Dozen, Lbs.	Per Dozen: Hose Thread	Per Dozen: Pipe Thread
3/4	7 1/2	5	$ 8.00	$ 9.20
3/4	12	9	10.00	11.20
1	8 1/2	7	10.00	11.20
1	12 1/2	12 1/2	12.00	13.20
1 1/4	12	16	20.00	21.20
1 1/4	15	18	24.00	25.00
1 1/2	13	22	25.00	27.50
1 1/2	15	24	30.00	32.50
2	12	32	38.00	41.00
2	15	38	45.00	48.00
2	20	52	50.00	53.00
2 1/2	15	47	75.00	78.50
2 1/2	20	71	96.00	99.50
2 1/2	24	74	100.00	103.50
2 1/2	30	82	144.00	150.00
2 1/2	36	91	157.00	163.00

HOSE NOZZLES

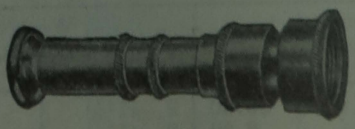


Fig. 2094

Adjustable for spray or solid stream.

Made of cast brass. Needle valve regulates discharge from solid stream to fine spray. Made in 3/4-inch size only.

Per Dozen

NO. 20—Weight per Dozen, 3 Lbs..... $9.00

HOSE REELS

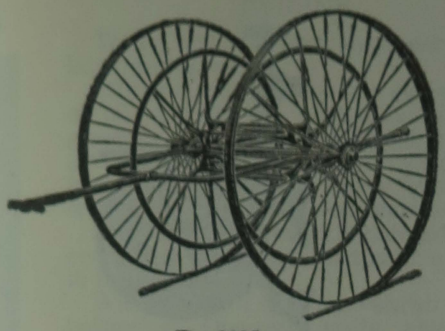


Fig. 2095

Style E

Suitable for lawn, park and greenhouse. Tubular steel frame, reel and tongue. All steel wheels with wide tires.

NOS.	Height Wheel, Inches	Outside Width, Inches	Capacity 1-Inch Hose, Feet	Weight Each, Lbs.	Each
90	36	31	200	75	$12.00
100	36	33	300	90	17.00
110	38	38	400	100	25.00

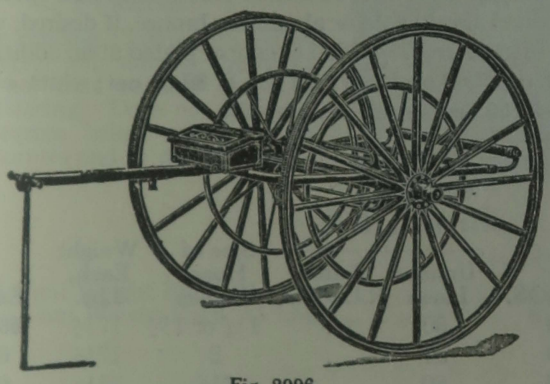


Fig. 2096

Style S

Strong tubular steel frames and reels, friction rollers and braces at rear of frames, tool boxes, with hooks for drag poles.

NOS.	Height Wheel, Inches	Outside Width, Inches	Capacity 2½ Inch Hose, Feet	Weight Each, Lbs.	Each
460	60	60	300	340	$80.00
461	66	64	500	400	110.00

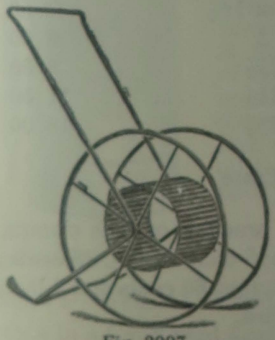


Fig. 2097

Diameter of wheels, 21½ inches; diameter of drum, 9 inches; width between wheels, 10 inches; length of handle, 28 inches. Capacity, 100 feet of ½ or ¾-inch garden hose. Black japan finish, carefully baked on.

	Each
NO. 1—Weight Each, 18 Lbs.	$2.25

FIREMAN'S AXES

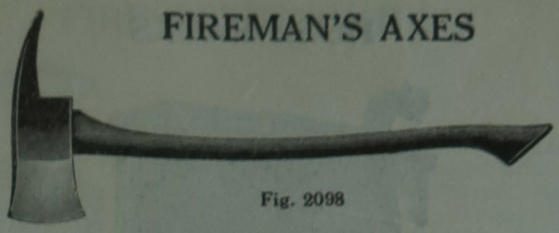


Fig. 2098

PICK HEAD TYPE

Forged from crucible steel; polished bit and pick; point carefully tempered; handled with 36-inch oval hickory handle.

	Per Dozen
Assorted Weight, 4½ to 8 Lbs.	$30.00

FIRE HOOKS

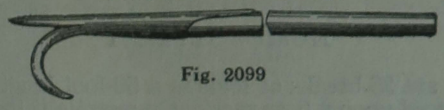


Fig. 2099

Galvanized wrought iron hooks; ash handles.

Length with Handles, Feet	9	10	12
Weight Each, Lbs.	10	12	13
Each	$3.40	3.75	4.50
Length with Handles, Feet	**14**	**16**	**18**
Weight Each, Lbs.	15	18	20
Each	$4.50	5.00	5.80

FIRE TOOL HOLDERS

Fig. 2100

Axe Holders

Fig. 2101

Spanner Holders

	Per Set
Axe Blade Holders, Japanned	$0.60
Axe Blade Holders, Polished Brass	1.35
Spanner Holders, Galvanized	.25

HOSE SPANNERS

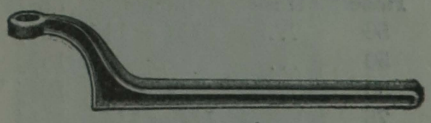


Fig. 2102

COMMON

Galvanized iron.

Length Overall, Inches			11
Weight per Dozen, Lbs.			9
For Couplings, Inches	1½	2	2½
Per Dozen	$2.75	3.75	4.25

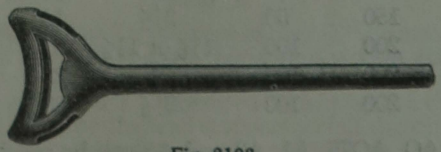


Fig. 2103

TABOR-REVERSIBLE

Galvanized malleable iron.

Length Over All, Inches	9½
Weight Each, Lbs.	1
For 2½-inch Couplings, Per Dozen	$6.00

HOSE RACKS

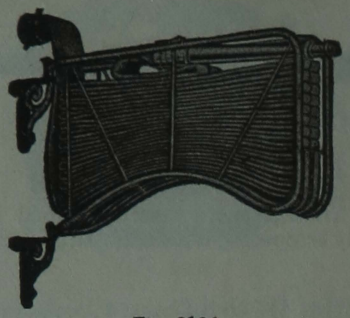


Fig. 2104
With Wall Brackets

HUMP—STYLE T

There are 25 breaks or folds in a 50-foot length of hose when placed upon a hose rack. On a straight flat bottom these breaks are sharp; on a bottom that is higher at the center than at the ends, the weight is taken off the ends, and these breaks become easy folds; therefore the hose will not break at the folds when run off. Another important feature of this rack is that the front end is partially enclosed. This basket formation holds the stack of hose in position when drawn off, preventing the stack from sliding out bodily and falling to the floor in a tangled mass. Either wall brackets or Pipe clamps can be furnished, attached to racks at top and bottom, insuring great strength.

Red japanned racks will be supplied unless otherwise specified. Finished in gold or aluminum bronze if desired, without additional cost. Finished in nickel or copper plate at an additional cost of $2.00 each, net.

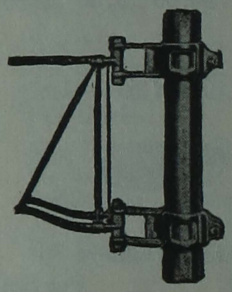


Fig. 2105
With Pipe Clamps

NOS.	Capacity Feet—Linen Hose	Capacity Feet—Cotton Mill Hose	For Hose, Inches	Weight Each, Lbs.	Each
AO	50	...	1¼ or 1½	10½	$5.00
AOX	50	...	2	10½	5.00
AOO	50	...	2½	10½	5.00
AO75	75	...	1¼ or 1½	11½	5.50
AOX75	75	...	2	11½	5.50
AOO75	75	...	2½	13	5.50
A1	100	25	1¼ or 1½	13	6.00
A1X	100	25	2	13	6.00
A2	100	25	2½	13	6.00
A3	150	50	1¼ or 1½	14	7.00
A3X	150	50	2	14	7.00
A4	150	50	2½	14	7.00
A5	200	100	1¼ or 1½	23	7.50
A5X	200	100	2	23	7.50
A6	200	100	2½	23	8.00

Nos. AO, AO75, A1, A3 and A5 can be specially made for 1-inch hose, without extra charge. Racks are furnished with wall brackets unless otherwise specified.

When ordering racks with pipe clamps, be sure to give size of pipe they are to fit. If not standard size pipe, give outside diameter.

One in a Crate

HOSE REELS

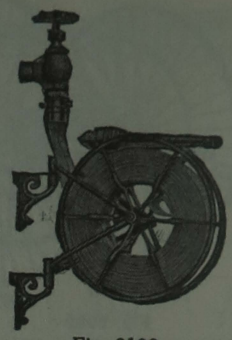


Fig. 2106
Style V

WALL SWINGING

Furnished with tension axles so the reel may be adjusted to run tight or loose as desired. Takes up little space and presents less surface for the accumulation of dust. Frame of steel tubing and steel rod; swings on two malleable iron wall brackets.

Will swing to any angle from the wall and the hose will unwind without a knot or a twist.

Red japanned reels furnished unless otherwise specified. Supplied also in gold or aluminum bronze, if desired, without extra charge. Nickel or copper plated at an additional cost of **$2.00 each net**; for No. 8, **$2.50 net**; white ename finish, **50 cents each net**, any size.

NOS.	Capacity Hose, Feet—Unlined Linen	Capacity Hose, Feet—Cotton R.L.Mill	Size of Hose, Inches	Weight Each, Lbs.	Each
0	50	...	1¼ or 1½	17½	$6.00
00	50	...	2	17½	6.00
000	50	...	2½	17½	6.00
0½	75	...	1¼ or 1½	19	6.00
00½	75	...	2	19	6.00
000½	75	...	2½	19	6.00
1	100	...	1¼ or 1½	24	6.00
2½	100	...	2	24	6.00
3½	100	...	2½	24	6.00
2	150	50	1¼ or 1½	27	6.00
3	150	50	2	27	6.00
4	150	50	2½	27	6.50
5½	200	...	1¼ or 1½	27	7.00
6½	200	...	2	28	7.50
7½	200	...	2½	29	8.00
5	300	100	1¼ or 1½	30	7.50
6	300	100	2	30	8.00
7	300	100	2½	30	8.50
8	400	150	2½	55	11.50
9	600	200	2½	55	15.00

One in a Crate

List prices include either wall brackets or pipe clamps, the latter not in excess of 4 inches; 5-inch clamps, **35 cents**; 6-inch clamps, **50 cents**; 7-inch clamps, **65 cents** and 8-inch clamps, **75 cents per pair net extra.**

Specify which is wanted when ordering.

FIRE EXTINGUISHERS

PYRENE

Fig. 2107

Tested and approved by underwriters' laboratories, inc.

Efficient and safe for use against fires of oil, gasoline or when live wires are present. The liquid is pumped from the extinguisher from a safe distance and the heat turns it into a heavy gas which settles over the flame and smothers it.

Automobile insurance is reduced 15 per cent when a Pyrene extinguisher is carried in the machine.

Will not stain or mar varnish or upholstering. Operates easily and refills quickly.

Shell made of brass, polished or nickel plated; interior mechanism consists of 43 separate parts made of brass and white metal. Length over all, 14 inches. Weight, 7 Lbs.

Metal Box, Complete with Extinguisher..... $11.00
Metal Box, Separately..... 1.50

FIRE EXTINGUISHER LIQUID

PYRENE

For refilling Pyrene Fire extinguishers; will damage nothing; does not mar varnish or stain upholstering. Does not freeze at 50 degrees below zero. Never deteriorates and is non-corrosive.

Fig. 2108

	Per Can
Quart Can; Weight Each, 3½ Lbs.....	$1.50
Gallon Can; Weight Each, 13 Lbs.....	6.00

FIRE EXTINGUISHERS

Fig. 2109

GUARDENE

Approved by the national board of fire underwriters. Shell constructed of heavy special cold rolled copper, heavily lined with lead; double-lock joint seam, reinforced on inside by a bronze stay; all sweated together and soldered thus making a smooth, strong joint. Bottom cannot be forced out at any pressure; works automatically, by turning bottom up the sulphuric acid is fed automatically into a supply of soda solution generating correct amount of gas at all times without danger of explosion; throws stream 50 feet, and will instantly extinguish an oil, tar, naphtha or gasoline fire. Capacity, 2½ gallons.

	Each
NO. F1—Weight Charged, 40 Lbs.....	$15.00

One in a Cardboard Carton with Directions for Charging

FIRE EXTINGUISHERS

Fig. 2110

FIRE GUN

Double acting liquid pumps. For gasoline, oil or electric fires. A non-conductor of electricity. Will not damage machinery or delicate fabrics. Holds twenty-five per cent more fluid, and discharges its contents in half the number of strokes of any similar device. Finished in brass or colored enamel.

	Each
NO. 1—3-Inch Diameter, 15 Inches Long. Capacity, 1¼ Quarts; Weight, 7¾ Lbs.....	$12.00
Glass "tamper-proof" Bracket, Extra.....	2.00
NO. 2—3-Inch Diameter, 21 Inches Long. Capacity, 1¾ Quarts; Weight, 11 Lbs.....	16.00

FIRE GUN FLUID

Charge for No. 1, (1¼ Quarts, U. S. Standard).....	$1.85
Charge for No. 2, (1¾ Quarts, U. S. Standard).....	2.50
One Quart (U. S. Standard).....	1.50
One Gallon (U. S. Standard).....	5.00

CHEMICAL FIRE ENGINES

GUARDENE—CHAMPION

Fig. 2111

TYPE A

Tank will withstand a pressure of over 600 pounds to the square inch and will throw a horizontal stream about 60 feet. Hose is ¾ inch internal diameter, tested to 500 pounds per square inch. Operated by turning the cylinder bottom up, allowing the lead stoppers to fall slightly away from the acid receptacles, thus permitting an even flow of acid into the soda solution. These streams are 40 times as effective as water. Easily and quickly handled and can be moved about by one person in a small space. English vermillion finish, striped, with polished brass fittings.

	Each
NO. 1—Weight Charged, 700 Lbs.....	$200.00

WATCHMAN'S CLOCKS

NEWMAN—GRILLE MODEL

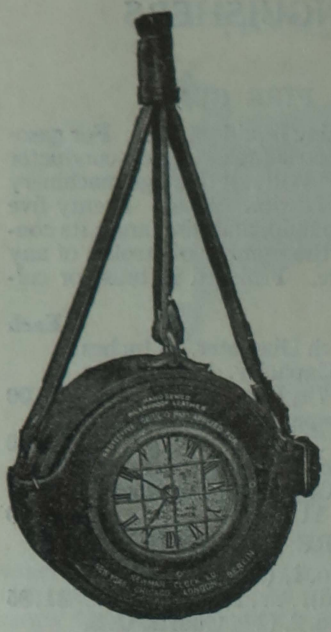


Fig. 2112

The Newman System equips the watchman with a portable watch clock which must be carried in rotation on every hourly inspection round to patrol stations located at the important inspection points and each having a key, which, when inserted and turned in the clock, registers on a paper dial therein the distinctive mark of that station and the exact time at which the station was visited.

The keys are fastened and sealed at the various stations preventing them from being removed without detection.

The clock itself is locked while in possession of the watchman and equipped with a pricking device which registers on the paper dial every opening and closing and the exact time at which the opening and closing take place.

By keeping the locking and winding keys and the supply of used and unused dials inaccessible to the watchman, he cannot open the clock or otherwise examine or tamper with his records without being detected. The user of a spurious key can never know the result of his attempts, yet each is recorded upon the paper dial and will be discovered on the following morning.

The case is substantially made of hard aluminum, combining lightness and strength, with tight fitting hinged lid and reinforced keyhole.

The movement of the Newman Grille Clock is equal to that of a fine pocket watch, being jewelled and having thick set plates and pillar posts to minimize damage in case of accident.

The pinions and pivots are made of high carbon tool steel and highly polished.

Teeth on all gear wheels are machine finished to an accuracy within one-thousandth of an inch.

The Newman Method is the only one in which there is only one moving part, the key itself, which does the registering; and altogether only three basic parts, as follows:

The key, upon the right angle flange of which is the raised number or character in the form of a male die.

A corresponding female die rigidly fixed within the clock and having a row of matrices, one for each station key.

A slotted tube or sleeve which fits snugly over and guides the key into the position in which its number, when the key is turned, presses into the matrix without the slightest deviation and embosses the paper dial which lies between.

These parts are made from metal which cannot corrode or rust.

The clock should be wound daily although it runs 60 hours at one winding.

PATROL KEY BOXES

The Newman Standard Box is convenient for attaching to posts, pillars, poles, walls, etc., with two flat headed screws, over each of which a seal is placed.

This is the model furnished as regular equipment. It was the first key receptacle invented to properly hold patrol keys, and first to receive approval of the National Board of Fire Underwriters.

Boxes are usually placed on a level with the clock as carried by the watchman.

Each seal, before being affixed, should bear the signature of the superintendent, and afterwards be covered with a coat of varnish, in accordance with insurance laws.

Fig. 2113

COMPLETE OUTFITS

Including watch clock, pouch with carrying strap, standard patrol boxes with marking keys attached, patrol box seals and one year's supply of dials.

	Outfit
6 Station Outfit	$73.00
9 Station Outfit	76.75
12 Station Outfit	80.75
16 Station Outfit	86.00
20 Station Outfit	94.00
25 Station Outfit	105.00
30 Station Outfit	115.00
35 Station Outfit	125.00

OILY WASTE CANS

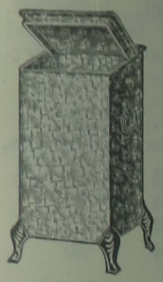


Fig. 2114

Galvanized steel; self-closing cover with heavy flanged rim closes by its weight; legs are of wrought steel. Approved by insurance underwriters.

NOS.	410	411	412	413
Length, Inches	12	16	16	22
Width, Inches	12	16	16	22
Depth, Inches	30	30	36	36
Weight Each, Lbs.	33	42	50	80
Each	$4.50	6.50	8.50	10.50

Fig. 2115

Galvanized, corrugated steel; self-closing cover fitted with heavy steel hinges. Malleable iron side handles, securely riveted; steel feet riveted on sides.

NOS.	1	2	3	4
Height, Inches	11¼	15½	17½	19¼
Width, Inches	11¼	12	13	14
Height from Floor, Inches	2½	3	3	3
Weight Each, Lbs.	50	65	70	80
Each	$3.05	3.90	5.20	6.40

NOS.	5	6	7	8
Height, Inches	21	22	27	32
Width, Inches	15	18½	20½	23½
Height from Floor, Inches	3	4	4	4
Weight Each, Lbs.	100	120	150	198
Each	$7.80	11.60	15.50	20.35

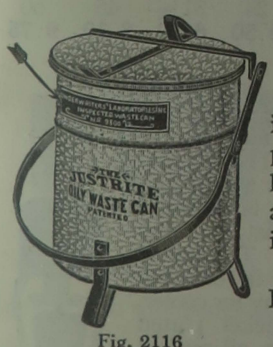


Fig. 2116

JUSTRITE

Malleable iron handle. Body is made of galvanized steel in one piece. Cover is raised by pressing handle with foot; cover closes automatically when foot pressure is released.

Approved by Underwriters' Laboratories, Inc.

NOS.	1	2	3
Depth, Inches	13	14	15
Width, Inches	11¾	12½	13½
Capacity, Gallons	6	8	10
Weight, Each	11	13	15
Each	$4.00	4.50	5.00

SAFETY CANS

FOR BENZINE AND GASOLINE

Fig. 2117

Construction is simple and durable. Spout is equipped with safety screen; cover controlling spring is inside and cannot rust. Body made of 24 gauge leaded plate, finished in baked red enamel; operated by a natural grip of the handle and lever; does not cramp the fingers. Approved by Underwriters' Laboratories.

	Each		Each
1 Pint	$1.50	1 Gallon	$3.00
1 Quart	1.75	3 Gallon	5.00
2 Quart	2.50	5 Gallon	6.00

FIRE PAILS

ROUND BOTTOM

Fig. 2118

Seamed body; wired top; steel wire bail; painted red with word "Fire" Stenciled on side.

GALVANIZED—PAINTED RED OUTSIDE

NOS.	310	312	314
Capacity, Quarts	10	12	14
Depth, Inches	10½	10¾	12
Width, Inches	9¾	10½	11
Weight Dozen, Lbs.	18	22½	25
Per Dozen	$8.60	9.10	9.90

GALVANIZED ONLY

NOS.	210	212	214
Capacity, Quarts	10	12	14
Per Dozen	$7.45	7.95	8.80

FLAT BOTTOM

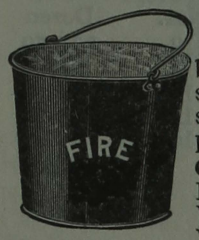


Fig. 2119

Seamed body; wired top; steel wire bail; galvanized and painted red outside, with word "Fire" stenciled on side.

NOS.	110	112	114
Capacity, Quarts	10	12	14
Depth, Inches	10½	11	11½
Width, Inches	8¾	10	10½
Weight per Doz, Lbs.	20	22	26
Per Dozen	$7.10	7.65	8.50

CONICAL SHAPE

Fig. 2120

Galvanized; wired top; riveted ears and wire bail.

NOS.	012	014
Capacity, Quarts	12	14
Per Dozen	$9.20	11.25

FIRE PAIL HOOK

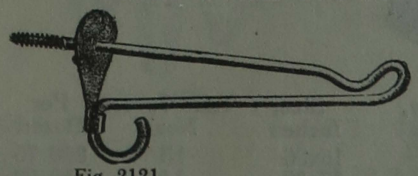


Fig. 2121

	Per Dozen
All steel, size of wire, No. 4. 8-inchprojection.	
NO. 1000—Japanned	$1.75

ASH CANS

Fig. 2122

BEADED

Steel beaded body, galvanized iron; hoop rolled in bottom; top reinforced by a flat hoop; riveted drop handles, canis water-tight; without covers.

NOS.	Capacity, Gallons	Size, Inches	Take Covers Nos.	Per Dozen
2	8¾	14x15½	12	$18.50
2½	11¾	14x18	12	22.15
3	17	15x26	13	25.90
4	22	17x26	14	29.50
5	24¾	18x26	15	33.30
6	31½	20x26	16	38.65
16	40	20x30	16	48.00

WOOD STAVES

Galvanized steel, reinforced by wood staves; flat hoop at top; rolled bottom hoop; riveted drop handles; without covers. Can is water tight.

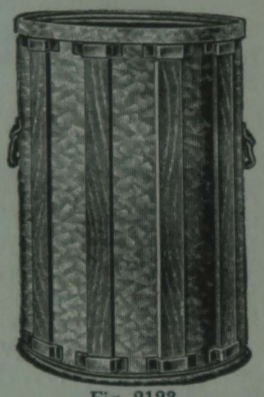


Fig. 2123

NOS.	Capacity, Gallons	Size, Inches	Take Covers Nos.	Per Dozen
6½	11¾	14x18	12	$27.70
7	17	15x26	13	31.25
8	22	17x26	14	35.05
9	24¾	18x26	15	38.90
10	31½	20x26	16	44.20

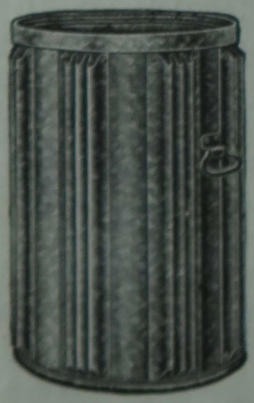


Fig. 2124

RIBBED STEEL STAVES

Extra heavy steel body, galvanized; reinforced at top with an iron band; ribbed steel staves; rolled bottom hoop; riveted drop handles; water tight. Without covers

NOS.	Capacity, Gallons	Size, Inches	Take Covers Nos.	Per Dozen
170	17	15x26	13	$36.75
180	22	17x26	14	40.20
190	24¾	18x26	15	44.20
200	31½	20x26	16	51.65

ASH CANS

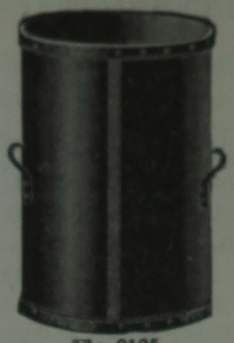


Fig. 2125

ENGINEERS'

Heavy gauge steel, japanned. Extra heavy hoops on top and double hoops on bottom, riveted to body, stationary handles.

NOS.	Capacity, Gallons	Size, Inches	Take Covers Nos.
030	17	15x24	13
040	22	17x24	14
050	24	18x24	15
060	30	20x24	16

Prices on Application

ASH CAN COVERS

Galvanized; seamless steel; fits over outside of can. Rim 1½ inches deep.

Fig. 2126

NOS.	12	13	14	15	16
Diameter, Inches	14½	15	17	18	20½
Wgt. per doz., Lbs.	26	30	38	40	50
Per Dozen	$6.20	8.30	10.20	12.40	14.70

Six in a Bundle

Fig. 2127

WATER COOLERS

Heavy japanned tin body; solid filled walls; nickel plated, self-closing push button faucet; soldered side handles; removable cover; galvanized iron reservoir; assorted colors; handsomely decorated.

NOS.	03	04	06	08	010
Capacity, Gallons	3	4	6	8	10
Diameter, Inches	11	12½	14½	15½	16½
Height, Inches	21	23	25½	28	30
Case Lots, Dozen	1/12	1/12	1/12	1/12	1/12
Case Weights, Lbs.	21	24	31½	45	50
Each	$4.30	5.30	6.20	8.10	9.75

20TH CENTURY

The water to be cooled cannot come into contact with the ice nor can the air from the ice enter the water receptacle. The ice container is made of fibre which is a non-conductor of heat. The water jar is of white porcelain; no metal parts to rust, nor any cracks or spaces to collect dust. The stands are strong and made of steel in oxidized copper finish. Furnished with tray for cooler, waste bucket and polished nickel plated brass drip cup for drinking glass, all packed in a carton with stand and cooler.

Fig. 2128

NOS.	160	560
Ice capacity, Lbs.	7-10	15
Weight, Each, Lbs.	20	30
Each	$12.00	15.00

Carried in stock in mahogany, white golden oak.

MEASURES

HEAVY TIN

Fig. 2129

Seamed and soldered 1C tin. Soldered lip and tin handle. U. S. Standard.

NOS.	124	125	126
Capacity, Quarts	1	2	4
Case Lots, Dozen	6	6	1
Case Weights, Lbs.	32	52	15
Per Dozen	**$5.70**	**8.25**	**10.50**

COPPER

Polished; tinned inside. U.S. Standard.

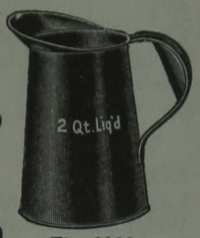


Fig. 2130

NOS	341	342	343
Pints	¼	½	1
Inches	2¼	2⅝	3¼
Per Dozen	**$6.00**	**8.00**	**11.00**
NOS	344	345	346
Quarts	1	2	4
Inches	4¼	5¼	6⅝
Per Dozen	**$16.00**	**24.00**	**36.00**

Fig. 2131

UTILITY SPOUT MEASURES

Heavy copper with funnel and pouring lip; handle on side. Made to conform to legal requirements of state and municipal inspection bureaus.

NOS.	251	252	253	254
Capacity, Quarts	½	1	2	4
Per Dozen	**$9.00**	**12.25**	**16.00**	**21.75**

DIPPERS

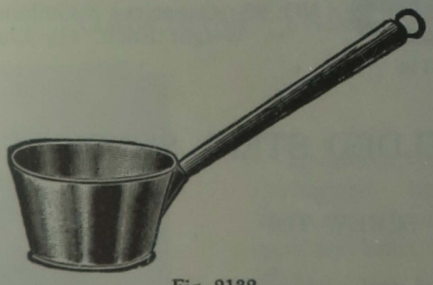


Fig. 2132

1C-Tin—Seamed and soldered rolled top rim; soldered handle with wire hanging ring.

NOS.	01	02	03
Capacity, Quarts	1	2	3
Inches	5½x3	6½x3¾	7½x4¾
Carton lots, Dozen	24	12	12
Carton Weight, Lbs.	88	59	95
Gross	**$23.10**	**24.90**	**40.50**

FUNNELS

Fig. 2133

HEAVY TIN

With tinned wire removable strainers. Fluted spout.

NOS.	115	120	125	130	135
Capacity, Pints	½	1	1	2	4
Inches	3½	4½	5½	6¾	8
Per Gross	**$16.80**	**20.90**	**24.90**	**33.00**	**45.60**

COPPER

Heavy; polished; tinned inside.

NOS.	00	01	02
Capacity, Pints	¼	½	1
Inches	2⅝	3⅜	4⅜
Per Dozen	**$4.00**	**5.00**	**7.00**
NOS.	03	04	05
Capacity, Quarts	1	2	4
Inches	5⅝	6⅜	7¾
Per Dozen	**$10.00**	**14.00**	**20.00**

Fig. 2134

WITH STOP VALVE

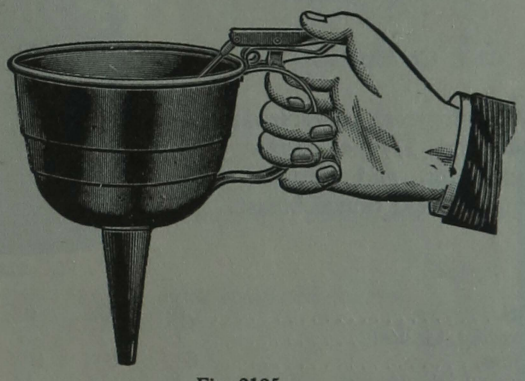


Fig. 2135

All copper; combined measure and funnel. Has shut off lever on top of handle; liquid will not flow unless lever is pressed.

NOS.	909	910	912
Capacity, Pints	1	2	4
Per Dozen	**$9.50**	**10.50**	**17.25**

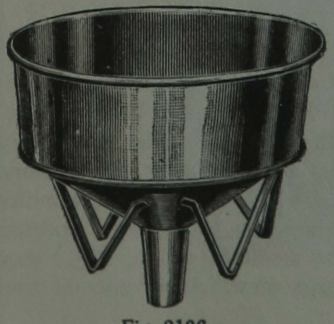


Fig. 2136

WITH STAND

For Use with Barrels

Made of heavy copper, with fine perforated removable strainer. Legs soldered on bottom to stand on barrel or tank.

NOS.	271	272	273	274	275
Capacity, Gallons	1	2	3	4	5
Each	**$2.10**	**2.35**	**2.65**	**2.90**	**3.20**

Can be fitted with gauze wire strainers for use in straining gasoline at an extra cost of 60 cents per dozen.

STORAGE TANKS

Fig. 2137

Heavy galvanized iron; double-seamed and soldered; beaded body; ⅝-inch diameter brass faucet. Tank has riveted handle on top for convenience in handling.

Capacity, Gallons	15	20	30
Dimensions, Inches	14x24	15x29	18x31
Weight Each, Lbs.	26	31	39
Each	$....	....	....

Capacity, Gallons	40	50	60
Dimensions, Inches	18x39¼	18x48½	20x48½
Weight Each, Lbs.	45	52	60
Each	$	....	....

Prices on Application

OIL CANS

CHAMPION

Fig. 2138

Wrought steel, galvanized; large spout and 1½-inch screw caps; banded top and bottom; plain stamped fluted tinned breast.

NOS.	0	02	03	05
Capacity, Gallons	1	2	3	5
Inches	6¼	8¼	9¼	10½
Carton Lots, Dozen	1	½	¼	¼
Carton Weight, Lbs.	15½	15½	12	16
Per Dozen	$....	....	....	....

Prices on Application

WAGON CANS

IDEAL

Fig. 2139

Made of extra heavy galvanized iron; heavy iron bands, top and bottom; reinforced neck. Five-gallon size has heavy bail handles strongly attached to cans. Ten-gallon size has heavy carrying handles riveted to breast. Has 4 inch opening and pouring spout extending 2½ inches below top into can which prevents oil from slopping out.

NOS.	250	251
Capacity, Gallons	5	10
Weight Each, Lbs.	7¼	11
Each	$4.00	5.30

OIL CANS

Fig. 2140

IRON AGE

Galvanized Iron with galvanized or tin tops; tinned iron faucets; with wire bail and handle.

TIN TOP

NOS.	1	2
Capacity, Gallons	3	5
Weight Each, Lbs.	3	3¾
Each	$1.35	1.75

GALVANIZED TOP

NOS.	3	4	5
Capacity, Gallons	3	5	10
Weight Each, Lbs.	3⅛	4¼	8
Each	$1.35	1.75	3.25

AUTO GASOLINE

Fig. 2141

Galvanized iron. Has 2½-inch spout with cover; filler cap at back, and lift handle on back to tilt can in pouring. Painted red and decorated.

	Each
NO. 343—Capacity, 5 Gallons; Weight Each, 4 Lbs.	$2.35

Fig. 2142

MONARCH-SWING

With faucet placed on top and filler cap at back side. Can is suspended on a strong iron swing, well balanced, preventing any drip or waste from faucet if not properly closed.

	Each
NO. 25—Capacity, 5 Gallons; Weight Each, 4¼ Lbs.	$2.00

WELDED STEEL SUPPLY CAN

SCREW TOP

Fig. 2143

Made of steel with collar, spout, ears, breast and 1¼-inch bottom reinforcing hoop all securely welded; will stand hard usage without developing a leak.

NOS.	060	60	61	62	63	64
Capacity, Gallons	½	1	2	3	4	5
Weight Each, Lbs.	1¾	2¼	3¼	4	4¼	6
Each	$2.00	2.00	2.50	3.00	3.50	4.00

OIL TANKS

Fig. 2144

CRESCENT

Made of heavy galvanized iron; a wood bottom beneath the metal bottom strengthens and protects the tank; heavy iron drop handles; removable pump; gauge rod for indicating amount of oil in tank; drip shelves for measures and funnels; hinged cover; over the galvanizing the tank is attractively painted, bronzed and lettered.

NOS.	1	2	3	4
Capacity, Gallons	6	12	30	60
Each	$....	....	....	....

NOS.	4	5	6	7	8
Capacity, Gallons	100	150	200	250	300
Each	$...	....	....	....	....

Prices on Application

NESCO

Corrugated bodies and bottoms, painted red. Each tank furnished with 1 pint, 1 quart and 2 quart tin measures and a 1 quart tin funnel.

Fig. 2145

NOS.	230	260	2106
Capacity, Gallons	30	60	106
Length Pump, Inches	33	38	47
Each	$...	....	....

Prices on Application

GASOLINE TANKS

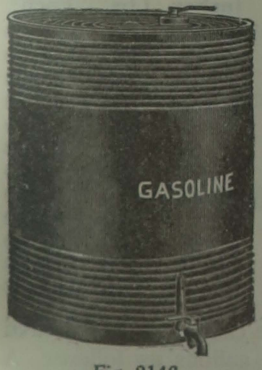


Fig. 2146

Galvanized, painted red, corrugated bodies and bottoms. Iron threaded caps and brass faucet with keys.

NOS.	136	163	1111
Capacity, Gallons	36	63	111
Each	$...	....	....

Prices on Application

OIL PUMPS

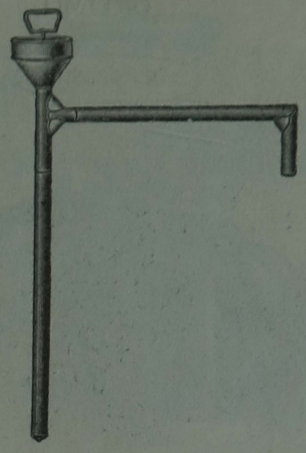


Fig. 2147

IDEAL

Designed for general warehouse use for transferring oil, etc. Made of extra heavy tin with wired edge around top, all joints heavily bossed. Pump barrel is 1½ inches in diameter. Discharge spout is 26 inches long.

NOS.	240	241	242
Length, Inches	30	36	42
Weight Each, Lbs.	3¼	3½	4
Each	$2.70	3.50	3.60

NOS.	243	244	245
Length, Inches	48	54	60
Weight Each, Lbs.	4¼	4¼	4½
Each	$3.70	3.80	3.90

HANDY

Designed for general use around shops and stores. Well made throughout. Serviceable and durable.

	Each
NO. 246—Height under spout, 36 inches Weight, 1¾ Lbs.	$2.10

Fig. 2148

BARREL PUMPS

ECLIPSE

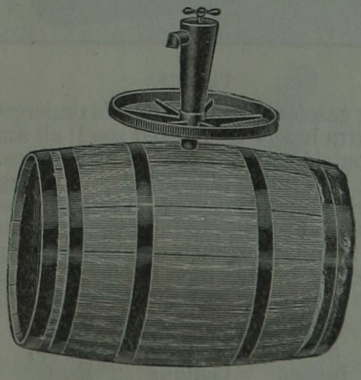


Fig. 2149

Useful device for handling oil direct from barrel. Fits bung hole of any barrel. Substantially built. The drip pan provides a receptacle for measures and funnels.

	Each
NO. 230—Weight, 5½ Lbs.	$7.00

Furnished to order with any length under drip pan.

BARREL PUMPS

OPTIMO

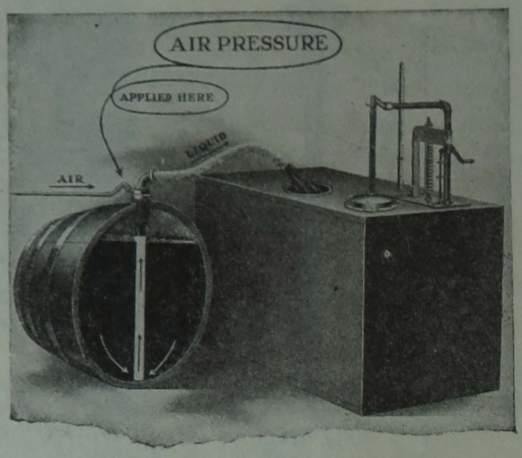


Fig. 2150

For oil, petroleum, paint, tar, ink, molasses, etc. Simply and solidly made to fit any size wooden barrel, or metal drum, and any size bunghole. Only a few seconds are required to adjust it into the bunghole of the barrel. It empties the barrel in less than three minutes and requires less than five pounds of air pressure to operate satisfactorily. Its efficiency increases with additional pressure.

	Each
NO. 1—Weight Each, 7½ Lbs.	$10.00

UNDERGROUND TANKS

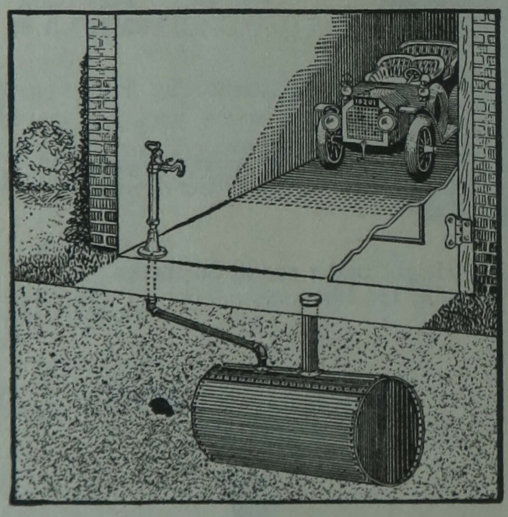


Fig. 2151

For storing gasolene, benzine or oils underground. Constructed of extra heavy galvanized steel; all seams welded. Covered on outside with a coat of asphaltum. Has two-inch wrought iron filling pipe fitted with wrought iron cap, vented and with hasp so it may be locked; also fine mesh brass wire screen at top of pipe and vented arrangement for filling tank. Standard ¾-inch wrought iron pipe runs from bottom to height of filler pipe for attaching pump and is supplied with iron pump base for fastening to floor.

NOS.	Size, Inches	Capacity, Gallons	With Pump, Each	Without Pump, Each
290	30x20	60	$28.00	$22.00
291	30x34	108	34.00	28.00
292	30x38	120	35.00	29.00
293	30x54	165	41.00	35.00
294	40x40	215	47.00	41.00
295	40x51	275	54.00	48.00
296	40x69	375	64.00	58.00
297	40x101	550	98.00	92.00

SAFETY OIL CABINETS

Fig. 2152
Bevel Top

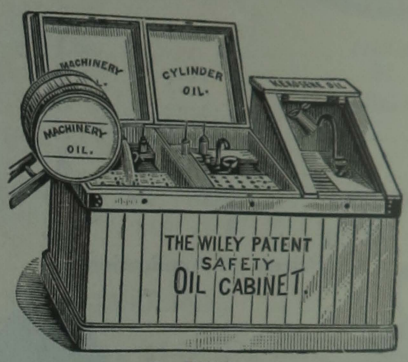


Fig. 2153
Flat Top

Constructed of matched white pine lumber of good quality, bound with bands. A solid sheet of heavy lead resting upon a heavy hard bottom, catches all the foreign substances in the oil and holds them harmless. The sides are lined with heavy galvanized metal. The hydraulic seal attached to the waste receiving orifice prevents evaporation. In all other tanks or cans there is a great waste of oil by evaporation and other causes. By means of the gauge rod attached to the cabinet, any shortage can at once be detected.

Each tank in a compartment has an iron force pump. Each compartment has a capacity for ten gallons more than the number of full barrels it is made for.

			—Bevel Top—		—Flat Top—		
Cap. Gallons	No. of Compartments	Cap. Bbls.	Width and Lgth. Inches	Wgt. Each Lbs.	Width and Lgth. Inches	Wgt. Each Lbs.	Either Style Each
25	1	..	20x22	120	22x22	110	$30.00
60	1	1	22x31	180	26x28	175	35.00
110	1	2	26x41	275	26x47	260	45.00
120	2	2	26x49	305	26x52	290	55.00
160	1	3	28x53	334	26x66	330	50.00
170	2	3	28x57	389	28x64	375	60.00
180	3	3	26x71	465	26x76	430	70.00
210	1	4	34x56	390	30x73	380	55.00
220	2	4	34x60	415	30x77	410	65.00
260	1	5	34x69	408	30x89	400	60.00
270	2	5	34x71	470	30x94	460	70.00
300	3	5	36x82	650	30x106	640	100.00

To ascertain the cost of a single cabinet of any desired capacity, add $5.00 for each 50 gallons as follows: A cabinet holding 110 gallons costs $45.00; one holding 160 gallons, $50.00 and so on up. If a double cabinet is wanted, add $10.00 to the price of a single one of the capacity desired. Each additional compartment costs $10.00 as appears in the list above.

WOOD FAUCETS

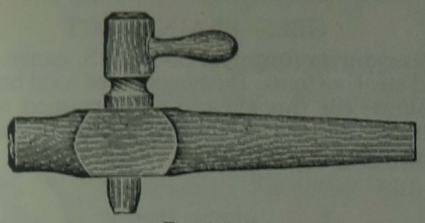


Fig. 2154

CORK LINED

Made of selected rock sugar maple and boiled in linseed oil.

Length, Inches	6	7	8
Weight per Dozen, Lbs.	1½	2	3
Per Dozen	$1.50	1.50	2.00
Length, Inches	9	10	12
Weight per Dozen, Lbs.	4	5	6
Per Dozen	$2.25	3.00	4.00

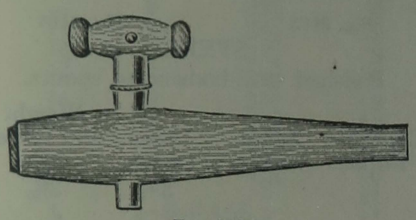


Fig. 2155

WITH METAL KEY

Maple wood body, highly polished; block tin key; leather lined.

Length, Inches	7	8	9	10	12
Weight per Dozen	5	6	7½	8	10
Per Dozen	$3.50	4.00	4.50	4.75	5.00

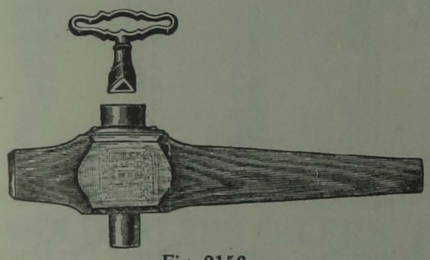


Fig. 2156

LOCK

Highly polished maple wood body with block tin trimmings; key may be removed to prevent theft.

Length, Inches	7	8	9	10
Weight per Dozen, Lbs.	6	7	8½	10¼
Per Dozen	$3.50	4.00	4.50	5.00

All Above, One Dozen in a Box

TAP BORERS

Fig. 2157

ENTERPRISE PATTERN

Forged oil tempered tool steel auger; cast steel reamer and head; double thread on screw; hardwood handles.

NOS.	1	2	3
Cuts, Inches	⅝ to 1½	1⅛ to 2	1½ to 3
Marked, Inches	¾ to 1½	1¼ to 2	1¾ to 3
Length Over All, Inches	11	13½	15
Weight Each, Lbs.	1	1¾	2½
Each	$1.50	2.25	3.00

OIL FAUCETS

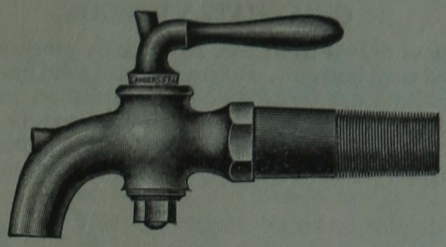


Fig. 2158

For petroleum oil; lever handle; screw shank for wood. Case iron with cast brass plug. Japanned finish.

Size, Inches	⅝	¾	1
Weight per Dozen, Lbs.	9	12	
Per Dozen	$10.00	11.00	
Size, Inches	⅝	¾	1
Weight per Dozen, Lbs.	14	18	24
Per Dozen	$13.00	16.00	23.00

OIL AND MOLASSES GATES

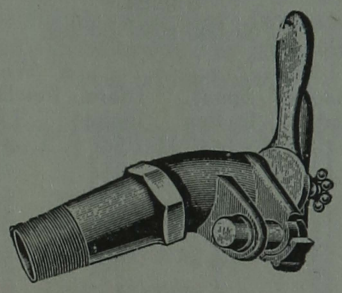


Fig. 2159

STEBBINS' PATTERN—SCREW SHANK

Japanned cast iron; steel adjusting screw in face.

NOS.	1	2
Bore, Inches	1	1⅛
Length, Inches	4½	4¾
Weight per Dozen, Lbs.	10	13
Per Dozen	$7.00	8.00

NOS.	3	4	5
Bore, Inches	1⅜	1⅝	1 13/16
Length, Inches	5¾	6	6¾
Weight per Dozen, Lbs.	22	27	28
Per Dozen	$9.00	10.00	12.00

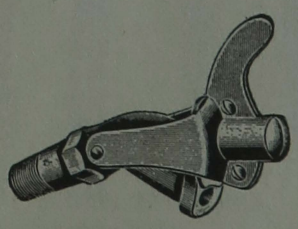


Fig. 2160

PERFECTION PATTERN

Japanned cast iron; milled face; polished brass plate between head and face; japanned wire coil spring in head to hold plate against face; will hold the thinnest fluids.

Bore, Inches	½	¾	1
Weight per Dozen, Lbs.	16	18	24
Per Dozen	$9.50	12.00	14.00
Bore, Inches	1¼	1½	2
Weight per Dozen, Lbs.	26	40	54
Per Dozen	$16.50	20.00	28.00

BENCH OILERS

GEM—PATENT SPOUT

Seamless drawn from No. 20 B. & S. gauge metal with tempered steel bottoms. Bushings are of solid brass castings with machine cut threads and are furnished with leather washers. All parts and all lengths of spouts are interchangeable. A self-cleaning device is contained in the spout which clears the spout of any obstruction.

Fig. 2161

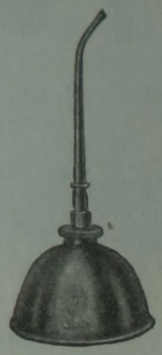


Fig. 2162

STEEL

Polished steel bodies.

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight Per Dozen, Lbs.	Per Dozen
1204	1/3	4	3 3/8	4 1/5	$5.00
1206	1/3	6	3 3/8	4 2/5	5.50
1209	1/3	9	3 3/8	4 3/5	6.00
1304	1/2	4	3 3/4	5 2/5	6.00
1306	1/2	6	3 3/4	5 1/2	6.50
1309	1/2	9	3 3/4	5 3/5	7.00
1404	3/4	4	4 1/8	6 3/4	7.00
1406	3/4	6	4 1/8	6 7/8	7.50
1409	3/4	9	4 1/8	7	8.00
1504	1	4	4 1/2	7 1/2	8.00
1506	1	6	4 1/2	7 3/5	8.50
1509	1	9	4 1/2	7 3/4	9.00

BRASS

Highly polished, finished and lacquered.

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight Per Dozen, Lbs.	Per Dozen
1204B	1/3	4	3 3/8	4 1/5	$8.00
1206B	1/3	6	3 3/8	4 2/5	8.50
1209B	1/3	9	3 3/8	4 3/5	9.00
1304B	1/2	4	3 3/4	5 2/5	9.00
1306B	1/2	6	3 3/4	5 1/2	9.50
1309B	1/2	9	3 3/4	5 3/5	10.00
1404B	3/4	4	4 1/8	6 3/4	10.00
1406B	3/4	6	4 1/8	6 7/8	10.50
1409B	3/4	9	4 1/8	7	11.50
1504B	1	4	4 1/2	7 1/2	11.00
1506B	1	6	4 1/2	7 3/5	11.50
1509B	1	9	4 1/2	7 3/4	12.50

STEEL SPOUTS

Length, Inches	4	6	9
Tubes Only, per Dozen	$0.60	.75	1.20
Spouts Complete, per Dozen	3.36	3.66	3.96

BRASS SPOUTS

Length, Inches	4	6	9
Tubes Only, per Dozen	$0.90	1.20	1.50
Spouts Complete, per Dozen	3.66	3.96	4.26

All Above, One Dozen in a Box

BENCH OILERS

GEM—PLAIN SPOUT

Seamless, drawn from No. 20 B. & S. gauge metal with tempered steel bottoms. Bushings are of solid brass castings with machine cut threads and are furnished with leather washers. All parts and all lengths of spouts are interchangeable.

Fig. 2163

Fig. 2164

STEEL

Polished steel bodies and spouts.

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight Per Dozen Lbs.	Per Dozen
1603	1/3	3	3 3/8	3 9/10	$4.75
1604	1/3	4	3 3/8	4	5.00
1606	1/3	6	3 3/8	4 1/10	5.50
1609	1/3	9	3 3/8	4 2/5	6.00
1703	1/2	3	3 3/4	5	5.75
1704	1/2	4	3 3/4	5 1/10	6.00
1706	1/2	6	3 3/4	5 1/5	6.50
1709	1/2	9	3 3/4	5 1/2	7.00
1803	3/4	3	4 1/8	6 2/5	6.75
1804	3/4	4	4 1/8	6 1/2	7.00
1806	3/4	6	4 1/8	6 3/5	7.50
1809	3/4	9	4 1/8	6 9/10	8.00
1903	1	3	4 1/2	7 1/10	7.75
1904	1	4	4 1/2	7 2/5	8.00
1906	1	6	4 1/2	7 3/10	8.50
1909	1	9	4 1/2	7 3/5	9.00

BRASS

Highly polished, finished and lacquered.

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight Per Dozen, Lbs.	Per Dozen
1603B	1/3	3	3 3/8	3 9/10	$7.75
1604B	1/3	4	3 3/8	4	8.00
1606B	1/3	6	3 3/8	4 1/10	8.50
1609B	1/3	9	3 3/8	4 2/5	9.00
1703B	1/2	3	3 3/4	5	8.75
1704B	1/2	4	3 3/4	5 1/10	9.00
1706B	1/2	6	3 3/4	5 1/5	9.50
1709B	1/2	9	3 3/4	5 1/2	10.00
1803B	3/4	3	4 1/8	6 2/5	9.75
1804B	3/4	4	4 1/8	6 1/2	10.00
1806B	3/4	6	4 1/8	6 3/5	10.50
1809B	3/4	9	4 1/8	6 9/10	11.50
1903B	1	3	4 1/2	7 1/10	10.75
1094B	1	4	4 1/2	7 2/5	11.00
1906B	1	6	4 1/2	7 3/10	11.50
1909B	1	9	4 1/2	7 1/5	12.50

STEEL SPOUTS

Length, Inches	3	4	6	9	12
Per Dozen	$2.50	2.75	3.25	4.25	5.75

BRASS SPOUTS

Length, Inches	3	4	6	9	12
Per Dozen	$3.25	3.50	4.25	5.00	6.25

Bent spouts are furnished on 6 and 9-inch sizes, unless otherwise ordered. Brass oilers will be furnished with brass bottoms if desired.

All Above, One Dozen in a Box

WIDE MOUTH OILERS

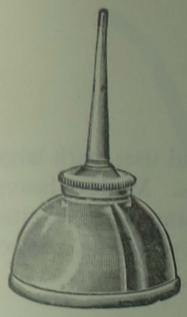


Fig. 2165

COPPERIZED

Drawn from 20-gauge cold rolled steel; has 1½-inch filler opening with solid brass cap. All spouts are interchangeable. Furnished with straight or bent spouts.

Heavily electro copper plated inside and out.

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight per Doz., Lbs.	Per Doz.
12	¼	2½	2¾	5	$4.50
13	..	3	3⅜	6	5.50
13A	..	6	3⅜	6	6.00
14	..	9	3⅜	6	6.50
14A	½	3	3¾	8	7.50
14AA	½	5	3¾	8	8.00
14B	½	9	3¾	8	8.50
15	1	3	4¼	10	9.25
15A	1	5	4¼	10	9.25
16	1	9	4¼	10	10.50

BRASS

Similar to above item, but made of brass, highly polished and lacquered.

NOS.	Capacity Pints	Spout, Inches	Diam., Inches	Weight Per Doz., Lbs.	Per Doz.
120	¼	2½	2¾	5	$6.50
130	..	3	3⅜	6	8.00
130A	..	5	3⅜	6	8.75
140	..	9	3⅜	6	9.20
140A	½	3	3¾	8	10.20
140AA	½	5	3¾	8	10.75
140B	½	9	3¾	8	11.20
150	1	3	4¼	10	12.00
150A	1	5	4¼	10	13.00
160	1	9	4¼	10	14.00

SOLDERLESS OILERS

Solderless bottom and collar oilers. Drawn from best cold rolled steel, brightly polished and lacquered. No solder or brazing applied in the construction of this can.

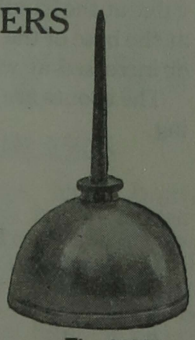


Fig. 2166

NOS.	Capacity, Pints	Spout, Inches	Diam., Inches	Weight Per Doz., Lbs.	Per Doz.
13–4	..	4	3⅜	3	$5.75
13–5	..	5	3⅜	3	6.00
13–6	..	6	3⅜	3¼	6.25
13–9	..	9	3⅜	3½	6.50
14–4	½	4	3¾	4	7.75
14–5	½	5	3¾	4⅛	8.00
14–6	½	6	3¾	4¼	8.25
15–9	½	9	3¾	4½	8.50
15–4	1	4	4⅛	5¼	9.50
15–5	1	5	4⅛	5½	9.75
15–6	1	6	4⅛	5¾	10.00
15–9	1	9	4⅛	6	10.50

All Above, One Dozen in a Box

MOWING MACHINE OILERS

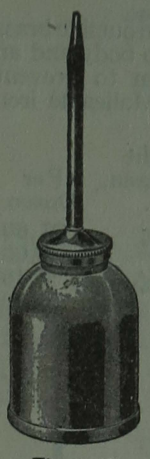


Fig. 2167

WIDE MOUTH—COPPER PLATED

Oilers have the collar attached to body of can and cap to spout without soldering or brazing. Threads are machine cut. Heavily copper plated outside and inside. Clock spring steel bottoms made from one piece of steel.

Furnished with breech lock or screw top.

Prices on Application

BREECH LOCK OILERS

Any of the wide mouth oilers can be supplied with the breech lock cap. It is of advantage in that with it the cap can be removed or put on by a single twist instead of having to unscrew the threaded cap. It makes a tight connection that will not be loosened by jar or vibration.

Prices on Application

CHACE PATTERN OILERS

Zinc body; raised tinned steel spring bottom. Large opening for easy filling. Cut leather washer prevents leakage at spout; seamed and soldered straight spout.

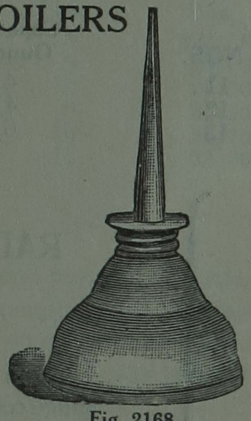


Fig. 2168

STEEL BOTTOMS

NOS.	Capacity, Ounces	Spout, Inches	Diam., Inches	Weight Per Gross, Lbs.	Per Gross
00	¾	1½	2 1/16	9¼	$12.00
0	1¼	1½	2 3/16	10½	15.00
1	2	3	2⅝	14	18.00
1½	3	3	2⅞	17½	21.00
2	4	4	3 3/16	20	24.00
3	6½	4	3¾	28½	27.00
4	8½	5	4⅛	35½	33.00
5	11	5	4½	47½	42.00
6	14	5	4¾	52	54.00

BRASS BOTTOMS

Bottoms double seamed to body.

NOS.	Capacity, Ounces	Spout, Inches	Diam., Inches	Weight Per Gross, Lbs.	Per Gross
00	¾	1½	2 1/16	10	$15.00
0	1¼	1½	2 3/16	11	18.00
1	2	3	2⅝	14	21.00
1½	3	3	2⅞	18	24.00
2	4	4	3 3/16	20	30.00
3	6½	4	3¾	29	36.00
4	8½	5	4⅛	36	42.00
5	11	5	4½	48	54.00
6	14	5	4¾	53	66.00

MALLEABLE IRON OILERS

Fig. 2169

Made with two bottoms, an outside brass bottom, securely soldered to body and an inside steel spring bottom to prevent setting of brass bottom. Malleable iron body and spout.

NOS.	Capacity, Ounces	Weight Per Dozen, Lbs.	Per Dozen
1	3	4½	$3.60
2	4¼	6	4.00
3	6¼	7¼	4.40
4	9	8	5.20

IMPROVED

Similar to above item except that instead of relying solely on the adhesion of the solder to secure the brass bottom to its place, and also to secure against leakage, a seating groove is formed in body of oiler, at the point of soldering, and the down turned flange of the brass bottom is forced into this groove, where it has a wide bearing, and is then securely soldered, making it absolutely proof against loosening or leakage from the working of the steel spring bottom.

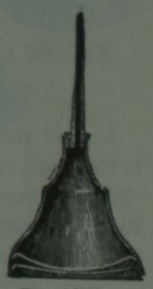


Fig. 2170

NOS.	Capacity, Ounces	Weight Per Dozen, Lbs.	Per Dozen
11	4	6	$5.40
12	4½	7	6.00
13	6¼	8½	6.60

RAILROAD OILERS

Fig. 2171

STEEL

These oilers are drawn seamless from 20 gauge cold rolled steel heavily electro-copper plated inside and out and highly polished. Spout connection is made by means of a union turned from solid bar brass, containing cut threads. Used by leading railroads.

NOS.	Capacity, Quarts	Diameter, Inches	Height, Inches	Spout, Inches	Per Dozen
10	½	3⅜	5	12	$14.00
10½	¾	3⅜	5½	12	16.00
11	1	4⅛	6	18	18.00
100	½	2⅜	6¼	10	14.00
101	1	4⅛	6	12	18.00
111	2	5	8	14	20.00

BRASS

Drawn seamless in two parts from 20 gauge brass, highly polished and lacquered.

NOS.	Capacity, Quarts	Diameter, Inches	Height, Inche	Spout, Inches	Per Dozen
17	½	3⅜	5	12	$18.00
18	1	4⅛	6	18	21.00
18A	2	5	8	14	24.00

PITCAR OILERS

Fig. 2172

For general railroad use; with large opening for heavy oils. Made of heavy gauge steel with seams hard spelter brazed. Extra heavy handle. Practically indestructible.

NOS.	Capacity, Quarts	Spout, Inches	Weight Per Doz., Lbs.	Per Dozen
36H	1	8	15	$16.00
37H	2	10	21	18.00
38H	3	12	25	21.00
39H	4	12	29	24.00

OIL CANS

SERRATED

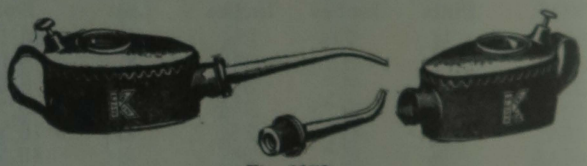


Fig. 2173

The bottom and sides are made of one piece of sheet steel, and being without joint, leakage becomes almost an impossibility. The oil is made to flow by pressing the valve at the handle, and this can be regulated by the tongue at the base of the spout, so that the stream may be reduced or increased at will.

The spouts are seamless and can be bent without breaking.

STEEL

NOS.	Capacity, Pints	Length Spout, Inches	With Interchangeable Steel Spouts, Per Doz.	With Copper or Brass Spouts, Per Doz.	Copper Spouts Only, Per Doz.
7	⅓	5	$7.60	$8.45	$1.00
8	½	6	8.30	9.10	1.35
9	¾	7	9.60	10.40	1.35
9A	1	8	11.50	12.40	1.65
10	1½	10	13.50	14.40	2.35
22A	2	12	15.50	16.40	2.65

Longer or shorter spouts than listed can be furnished and will be charged accordingly.

SPOUTS ONLY
STEEL—INTERCHANGEABLE

Formed of one piece of metal, double wrapped and dipped in molten metal, thereby making them practically seamless; may be bent in any form without danger of leakage.

Length, Inches	5	6	7	8	10	12
Per Dozen	$1.00	1.50	1.50	2.00	2.50	3.00

ENGINEERS' FILLERS

Fig. 2174

Seamless drawn cold rolled steel heavily copper plated outside and inside. Screw top.

NOS.	Capacity, Pints	Diam., Inches	Height, Inches	Weight Per Doz., Lbs.	Per Doz.
19	1	4⅛	3½	7½	$14.00
19A	1½	4¾	4	10½	17.00
210	2	5	5	11	20.00
211	4	6	6	15¼	24.00

TALLOW POTS

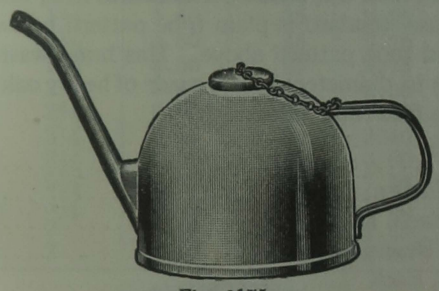


Fig. 2175

Made of heavy steel with extra large spout and two-inch filling opening with tapered metal plug attached to handle by a chain. Copper plated inside and outside.

NOS.	Capacity, Quarts	Diam., Inches	Height, Inches	Weight Per Doz., Lbs.	Per. Doz.
212	1	5	5	10½	$21.00
213	2	6	6	16	25.00

ENGINEERS' DRIP OILERS

Fig. 2176

Used on steamships, motor boats, private yachts and by large manufacturing plants, city water departments, pumping stations and railroads. Will not dribble oil over machinery or floors. Oil cannot flow until button is pressed. Made in tin, brass or nickel with spouts from 6 to 24 inches long. All spouts 14 inches and over are made double, giving them additional strength.

NOS.	Capacity, Pints	Weight Per Doz., Lbs.	Tin, Per Dozen	Brass, Per Dozen	Nickel, Per Dozen
34	½	⅝	$ 8.50	$12.00	$15.00
36	1	⅞	10.00	15.00	18.00
38	2	1⅛	12.00	18.00	21.50
39	4	1½	14.50	21.00	26.50
		WITH DETACHABLE SPOUTS			
036	1	1	$15.00	$21.00	$24.00
038	2	1¼	18.00	24.00	27.50
039	4	1⅝	21.00	27.00	32.50

PUMP OILERS

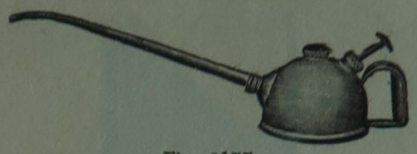


Fig. 2177

AUTO STEEL

Body of oiler is drawn seamless, 20 gauge cold rolled steel, heavily electro copper plated; equipped with pump, having two valves working automatically, which delivers the oil to the bearings in a small or large quantity at one stroke of the plunger, depending on the length of the stroke.

NOS.	Capacity, Pints	Diameter, Inches	Weight Per Doz., Lbs.	Per Doz.
800	½	3¾	8	$23.00
801	½	3¾	9	23.50
802	½	3¾	10	24.00
802½	1	4¼	9	24.75
803	1	4¼	10	25.25
804	1	4¼	11	25.75

BRASS

NOS.	Capacity, Pints	Diameter, Inches	Weight Per Doz., Lbs.	Per Doz.
900	½	3¾	8	$28.50
901	½	3¾	9	29.00
902	½	3¾	10	29.50
902½	1	4¼	9	31.25
903	1	4¼	10	31.75
904	1	4¼	11	32.00

TORMAY

For oiling car wheels and for general purposes in shops.

Forcibly ejects a pre-determined quantity of oil from the reservoir at one movement of the operating mechanism. No oil can escape and oiler may be placed in any position when not in use, without leakage of contents.

Fig. 2178

Capacity, Gallons	Length Spout, Inches	Feeds at Each Operation, Ounces	Weight Each, Lbs.	Each
½	12	1/20 to 1¼	7	$5.75
¾	5	1/20 to 1¼	12	6.25

WITH PUMP HANDLE

Capacity, Gallons	Length Spout, Inches	Feeds at Each Operation, Ounces	Weight Each, Lbs.	Each
1	5	1/20 to 1¼	10	$8.00
1½	5	¾ to 3½	13	9.50

Fig. 2179

OILER SETS

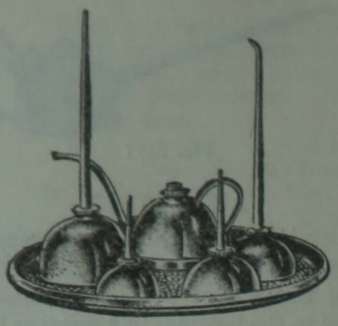


Fig. 2180

ENGINEERS'

Steel sets are heavily copper-plated and handsomely finished. Brass oilers are seamless drawn and highly polished; furnished with round trays.

STEEL SETS

NOS.	30C	40C	50N	60N
Width Tray, Ins.	13	13	13	13
No. Pieces	5	6	5	6
Finish	Coppered	Coppered	Nickeled	Nickeled
Per Set	$5.00	7.00	7.00	9.00

BRASS SETS

NOS	30	40	50	60
Width Tray, Ins.	12	14	12	14
No. Pieces	5	6	5	6
Finish	Polished	Polished	N. Plated	N. Plated
Per Set	$6.00	9.00	8.00	11.00

OILER SET STANDS

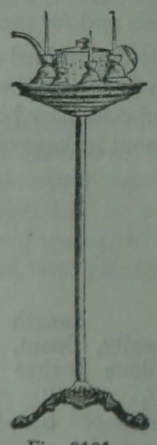


Fig. 2181

Convenient for power plants, engine rooms, etc.; black enameled; ornamental iron base. Plain brass tubing standard; brass holder takes six-piece oiler set with fourteen-inch tray.

No. 2 stand (not illustrated) has pocket for waste, oily rags, etc.

NOS.	1	2
Height, Inches	36	36
Weight Each, Lbs.	13	13
Polished Brass, Each	$ 8.00	10.00
Nickeled, Each	$10.00	12.00

Prices Do not Include Oilers

OILER SET STANDS

Fig. 2182

WITH TOOL BOARD

Well made stand for holding oiler sets, tools, torches, waste, etc. Add to the neatness and efficiency of engine rooms, power plants, etc.

Tray holder made of heavy brass, to hold 6-piece oiler set with 14-inch tray. Base, ornamental iron, black enameled. Brass standard is plain tube pattern below the tool board and rope pattern above. Has brass waste pocket, 10 inches in diameter; board, made of heavy oak 24 inches square, is filled and varnished.

NO.	4
Height, Inches	37
Weight Each, Lbs.	24
Polished Brass, Each	$25.00
Nickeled, Each	27.00

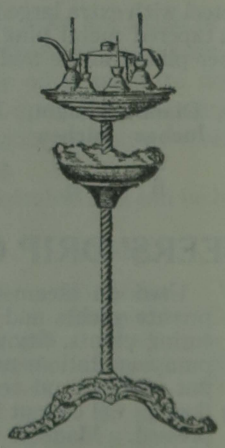


Fig. 2183

WITHOUT TOOL BOARD

Has brass rope tubing standard; ornamental, black enameled cast iron base. Tray holder made of heavy brass, to hold 14-inch tray (6-piece oil set); waste pocket made of heavy brass and is 10 inches in diameter.

NO.	5
Height, Inches	37
Weight Each, Lbs.	24
Polished Brass, Each	$22.00
Nickeled, Each	24.00

Prices Do not Include Tools or Oilers

STEEL LETTERS AND FIGURES

For stamping steel, iron, brass, wood, leather, etc. Sizes 1/32 to 1/2-inch letters.

Made from the best refined steel; perfectly tempered and properly cut; sizes of steel are used that are suitable for the letter and figure, and long enough so that it can be held without hitting the fingers. When ordering, state lettering, size of letters and the nature of the material to be stamped. Prices below are for plain letters and figures only.

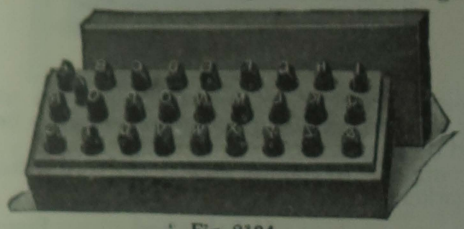


Fig. 2184

LETTERS—28 in Set

Size, Inches	Weight Per Set, Lbs.	Hand Cut		Machine Cut	
		Per Set, of 28	Each	Per Set, of 28	Each
1/32	1	$7.50	$0.35	$3.75	$0.20
1/24	1	6.00	.30	3.75	.20
1/20	1	4.50	.25	3.75	.20
1/16	1	4.50	.25	3.75	.20
1/12	1	4.50	.25	3.75	.20
3/32	1 1/2	4.50	.25	3.75	.20
1/10	1 1/2	4.50	.25	3.75	.20
1/8	1 1/2	4.50	.25	3.75	.20
5/32	2 3/8	5.25	.30	4.05	.25
3/16	2 3/8	6.00	.30	4.50	.25
7/32	3 1/4	6.50	.35	5.40	.30
1/4	3 1/4	7.00	.35	6.00	.30
5/16	5 7/8	8.50	.40	7.50	.35
1/8	6 1/4	10.00	.45	9.00	.45
7/16	7	12.50	.70	11.25	.60
1/2	7	14.00	.75	13.50	.60

Fig. 2185

FIGURES—9 in Set

Size, Inches	Weight Per Set, Lbs.	Hand Cut		Machine Cut	
		Per Set, of 9	Each	Per Set, of 9	Each
1/32	1/2	$2.50	$0.35	$1.25	$0.20
1/24	1/2	2.00	.30	1.25	.20
1/20	1/2	1.50	.25	1.25	.20
1/16	1/2	1.50	.25	1.25	.20
1/12	1/2	1.50	.25	1.25	.20
3/32	1/2	1.50	.25	1.25	.20
1/10	1/2	1.50	.25	1.25	.20
1/8	1/2	1.50	.25	1.25	.20
5/32	1	1.75	.30	1.35	.25
3/16	1	2.00	.30	1.50	.25
7/32	1 1/4	2.20	.35	1.80	.30
1/4	1 1/4	2.35	.35	2.00	.30
5/16	1 3/4	2.85	.40	2.50	.35
3/8	2 1/2	3.35	.45	3.00	.45
7/16	2 3/4	4.20	.70	3.75	.60
1/2	3	4.70	.75	4.50	.60

STEEL STAMPS

Fig. 2186

HAND CUT

Made from the best refined steel; perfectly tempered and properly cut. Prices below are for plain letters and figures only.

Size, Inches	Per Letter	Size, Inches	Per Letter	Size, Inches	Per Letter
1/32	$0.80	1/8	$0.60	7/16	$1.60
1/24	.70	5/32	.70	1/2	1.70
1/20	.60	3/16	.80	5/8	1.90
1/16	.60	7/32	1.00	3/4	2.25
1/12	.60	1/4	1.10	7/8	2.50
3/32	.60	5/16	1.30	1	2.75
1/10	.60	3/8	1.50	.....	.....

Stamps with letters over 1/8 inch will be charged extra at the rate of 50 cents per lb. for steel and forging.

BURNING BRANDS

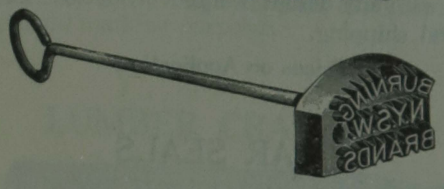


Fig. 2187

These brands are solid, eliminating trouble of letters getting loose or falling out.

	Each
Size—1/4, 3/8 and 1/2 Inch, Three Letters or Less	$2.75
Additional Letters	.50
Size—5/8, 3/4 Inch, Three Letters or Less	3.50
Additional Letters	.60
Size—1 Inch, Three Letters or Less	3.75
Additional Letters	.65
Punctuation Marks	.30

BRASS CHECKS

Fig. 2188

FOR WIRE OR STRAP

We are prepared to furnish brass or aluminum checks of any design and with any lettering. Tool checks, baggage checks, claim checks, lettered.

Prices on Application

BOX AND CAR SEALS

Fig. 2189

ANCHOR

The quality and design of the wire assures a firm anchorage, making seals positive and safe. Seals proper are solid castings, with the exception of a single opening at which the wire enters.

	Per Thousand
NO. 10	$7.50

Note.—Seals and wires of various other designs can also be furnished.

SEAL PRESSES

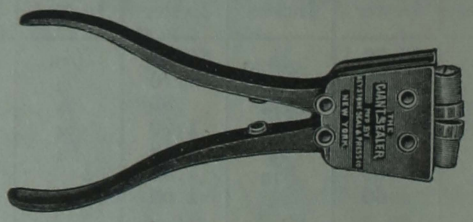


Fig. 2190

GIANT

For use with box and car seals. A high-grade, forged steel tool with compound leverage. Can be furnished with plain punch or with any design wanted. Suitable for railroad and general shipping.

Prices on Application

CAR SEALS

Fig. 2191

KEYSTONE

The design of this seal and lock is such that it is impossible for it to be fraudulently opened and replaced to avoid detection. It cannot be picked or sprung open and the seal impression cannot be duplicated except by the original seal press.

	Per Thousand
NO. 20	$25.00

SEAL PRESSES

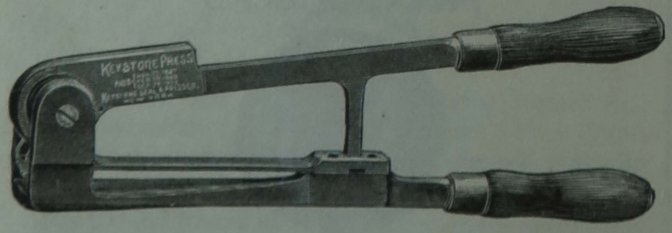


Fig. 2192

KEYSTONE

Used with above seals. Constructed on ratchet principle, locks itself down by stages as it closes. Drop forged steel construction.

	Each
NO. 200—Weight Each, 3½ Lbs.	$15.00

STENCILS

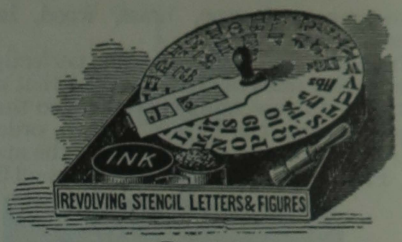


Fig. 2193

Complete stenciling set for shipping room use. Any word or number including several fractions can be quickly stenciled by its use.

Set contains: Revolving stencil plate of brass with a space marker, sponge, cake of ink and a brush.

Size, Inches	Alphabet and Figures, Per Set	Figures only, Per Set
⅛, ¼, ⅜	$1.60	$0.90
½	1.60	.90
⅝	2.00	1.00
¾	2.00	1.00
⅞	2.50	1.10
1	2.50	1.10
1¼	3.20	1.30
1½	*2.50	1.60
2	*3.20	1.90
2½	.....	2.20
3	.....	2.50
3½	.....	2.80
4	.....	3.20

*Without Figures

Fig. 2194

COMPLETE SETS

Hand cut brass stencil set. Each box contains alphabet, figures, ink and brush.

Furnished with smooth and uniform paste. Marks made with these pastes, mixed with water, will not wash or rub off, for when water evaporates, the adhesive oils in the pastes fix the colors permanently, making them water-resisting and ever fast.

Size, Inches	Per Set	Size, Inches	Per Set
½	$1.20	1½	$2.00
¾	1.40	1¾	2.25
1	1.60	2	2.50
1¼	1.80	2½	3.70

STENCILS ONLY

Size, Inches	Alphabet, Per Set	Figures, Per Set
¼	$0.60	$0.30
⅜	.60	.30
½	.60	.30
¾	.75	.35
1	.90	.40
1¼	1.05	.45
1½	1.20	.50
1¾	1.35	.60
2	1.50	.70
2½	2.40	1.00

MARKING POTS

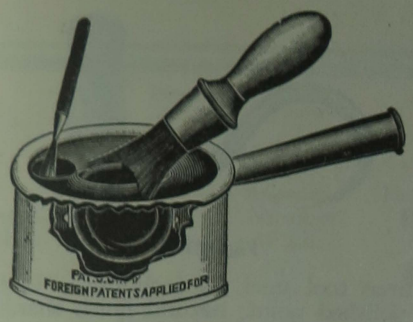


Fig. 2195

A very handy and convenient marking pot for shipping room use. The stencil brush is inked by applying it to the revolving ball which is in contact with the ink in the pot. This device prevents evaporation or waste of ink and keeps out the dirt. A hole in the top provides for use of a marking brush. Furnished, made of either copper or tin.

	Per Doz.
NO. 1—Tin	$3.00
NO. 1A—Copper	7.50

IC Tin, seamed and soldered; removable stamped tin top. Height, 3¾ inches.

	Per Doz.
NO. 6—Weight per Dozen, 4 Lbs.	$5.10

Fig. 2196

STENCIL BRUSHES

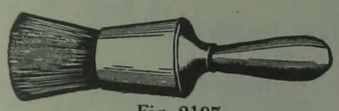


Fig. 2197

Grey bristle brushes have zinc ferrules and black enameled handles.

NOS.	6	8	10
Diameter, Inches	⅞	1¼	1⅜
Per Dozen	$5.00	6.00	8.00

ALL WHITE BRISTLE

White bristle brushes have nickel ferrules; polished hardwood handles.

NOS.	6	8	10
Diameter, Inches	⅞	1¼	1⅜
Per Dozen	$5.50	7.00	10.00

MARKING BRUSHES

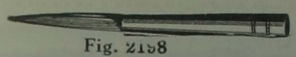


Fig. 2198

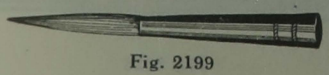


Fig. 2199

Plain cedar handles.

WHITE BRISTLES

NOS.	1	2	3
Diameter, Inches	⅛	5/32	3/16
Per Dozen	$1.00	1.20	1.40

NOS.	4	5	6
Diameter, Inches	7/32	¼	9/32
Per Dozen	$1.60	1.80	2.00

CAMEL HAIR

NOS.	1	2	3	4
Diameter, Inches	⅛	5/32	3/16	7/32
Per Dozen	$1.50	1.80	2.20	2.60

LAMP BLACK

For marking and stenciling purposes; also used as coloring in paint, concrete, etc.

Per Pound $0.20

Packed in One-Pound Boxes

CARPENTERS' CHALK

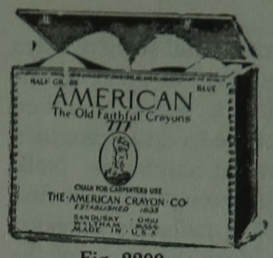


Fig. 2200

Made in hemisphere shaped cakes, and can be furnished in white, red or blue. Used largely for chalk lines, marking on lumber, and also for laying out pattern work on metal. Packed in lock corner wood boxes.

In Half Gross Boxes

Color	White	Blue	Red
Per Gross	$1.25	1.50	1.50

SCHOOL CRAYONS

Packed in neat wood boxes with sliding cover.

Per Gross $0.25

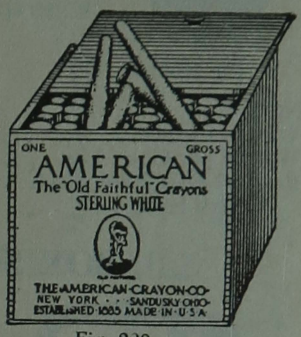


Fig. 220.

SOAPSTONE CRAYONS

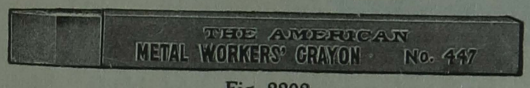


Fig. 2202

Used in many of the large mills for marking on metal, and for general marking purposes.

	Per Gross
NO. 447	$3.50

LUMBER CRAYONS

Fig. 2203

	Per Gross
NO. 365—Soft; Black, for Green Lumber, Paper Covered; Weight per Gross, 10¼ Lbs.	$6.00
NO. 365½—Very Soft; Black, for Green Lumber, japanned; Weight per Gross, 10¼ Lbs.	6.00

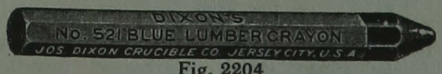


Fig. 2204

Hexagon Shape, Paper Covered.	Per Gross
NO. 495—Brown; Weight per Gross, 11⅛ Lbs.	$10.80
NO. 496—Yellow; Weight per Gross, 11⅛ Lbs.	10.80
NO. 497—Terra Cotta; Weight per Gross, 11⅛ Lbs.	10.80
NO. 520—Red; Weight per Gross, 11⅛ Lbs.	10.80
NO. 521—Blue; Weight per Gross, 11⅛ Lbs.	10.80
NO. 522—Green; Weight per Gross, 11⅛ Lbs.	10.80
NO. 523—White; Weight per Gross, 11⅛ Lbs.	10.80

CARPENTERS' PENCILS

Fig. 2205

	Per Gross
NO. 538—Cedar; Octagon; Maroon Finish; Gilt Stamp; Length Leads, 7 Inches; Weight per Gross, 3 Lbs.	$6.00

All Above, One-half Gross in a Box

BOX STRAPPING

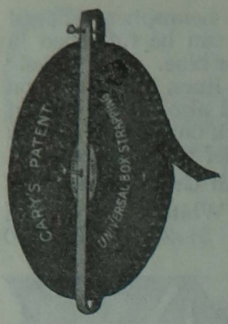


Fig. 2206

A continuous metal strap of extra soft annealed steel of great tensile strength with a series of raised bosses along the edges, to strengthen same and protect nail heads. Nails can be driven through without first punching holes; nails are intended to be driven along the center of the strap between the bosses.

NOS.	0	1	2	3	*3
Width, Inches	½	⅝	¾	1	1
Weight per Case, Lbs.	180	220	270	400	480
Per 300 Foot Reel, Each	**$1.00**	**1.25**	**1.50**	**2.00**	**2.50**

*Extra heavy.

BOX SCRAPERS

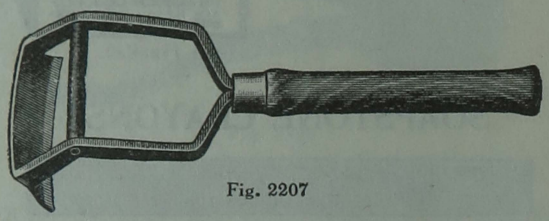


Fig. 2207

Tempered and polished tool steel blade. Malleable iron shank; plain hardwood handle, 6½ inches long, with tinned cast iron ferrule; width of blade, 6 inches; length over all, 14 inches.

	Each
NO. 22—Weight Each, 1½ Lbs.	$0.75

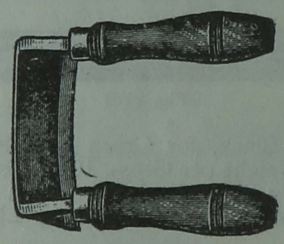


Fig. 2208

Double handle; tool steel forged blade, polished face; japanned back; plain finish hardwood handles; steel ferrules; shanks extend through handle, riveted at end with washer; width of blade 5¼ inches; length of handles 5 inches; length over all, 7 inches.

	Each
NO. 18—Weight Each, 1 Lb.	$0.70

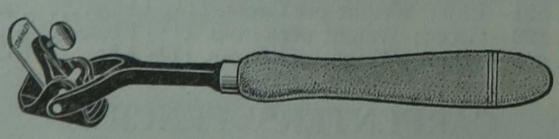


Fig. 2209

ADJUSTABLE

Japanned cast iron frame, shank and cap; tempered and polished tool steel blade; polished hardwood handle with iron ferrule; steel set screw in cap to secure blade; width of blade, 2 inches; length of handle, 7¾ inches; length over all, 13 inches.

	Per Doz.
NO. 70—Weight Each, 1 Lb.	$10.80

CASE HOOKS

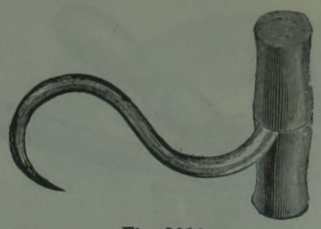


Fig. 2210

Forged from tool steel, 5/16 inch thick, ½ inch wide; tempered; polished point; natural finish shank; polished hardwood handle, 5¾ inches long; shank extends through handle and is riveted at top with square flush washer.

Size, Inches Under Handle	Weight Each, Ounces	Each
10	12	$2.00
8	10	1.50
7	8	1.00

COTTON HOOKS

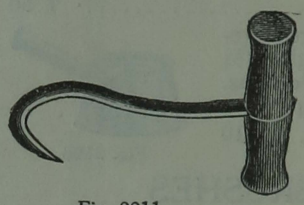


Fig. 2211

Forged from high grade crucible steel, tempered; polished square and point; balance of hook natural finish; polished and lacquered hardwood handle; shank extends through handle and riveted at top with washer, flush with handle; diameter of hook, ⅜ inch; length of handle, 5 inches; length over all, 8 inches.

NOS.	Size Hook, Inches	Weight Each, Ounces	Each
1	7	13	$0.40
2	8	11	.50
3	9	9	.55

NAIL PULLERS

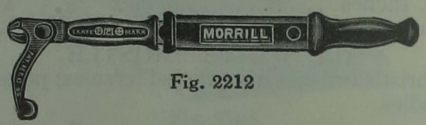


Fig. 2212

Jaws and shanks forged from good quality steel, hardened and oil tempered; jaws and shank polished points fine polished, handles finished in jet black enamel.

	Per Doz.
NO. 1—Length, 18 Inches; Weight per Dozen, 48 Lbs.	$36.00

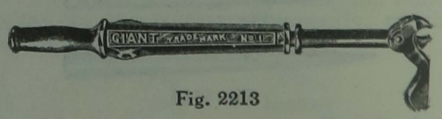


Fig. 2213

Forged steel claws and bar with cast iron japanned rammer; polished jaws. A rapid working efficient tool.

NOS.	1	2
Weight per Dozen, Lbs.	60	48
Per Dozen	**$20.00**	**16.00**

BOX CHISELS

Fig. 2214

Forged from tool steel; tempered and polished jaws; natural finish shank and head.

Length, Inches	14	16
Weight per Dozen, Lbs.	20	24
Per Dozen	**$11.50**	**13.00**

WIRE NAILS

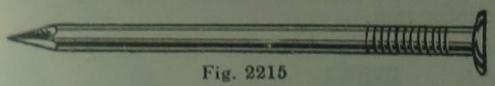


Fig. 2215

COMMON

Size	Length, Inches	Wire Number	Approx. Number to Lb.	Extra Over Base, Per 100 Lbs.
2	1	15	876	$0.70
3	1¼	14	568	.45
4	1½	12½	316	.30
5	1¾	12½	271	.30
6	2	11½	181	.20
7	2¼	11½	161	.20
8	2½	10¼	106	.10
9	2¾	10¼	96	.10
10	3	9	69	.05
12	3¼	9	63	.05
16	3½	8	49	.05
20	4	6	31	Base
30	4½	5	24	Base
40	5	4	18	Base
50	5½	3	14	Base
60	6	2	11	Base

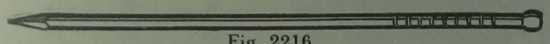


Fig. 2216

FINISHING

Size	Length, Inches	Wire Number	Approx. Number to Lb.	Extra Over Base, Per 100 Lbs.
2	1	16½	1351	$1.15
3	1¼	15½	807	.85
4	1½	15	584	.65
5	1¾	15	500	.65
6	2	13	309	.45
7	2¼	13	238	.45
8	2½	12½	189	.35
9	2¾	12½	172	.35
10	3	11½	121	.25
12	3¼	11½	113	.25
16	3½	11	90	.25
20	4	10	62	.25

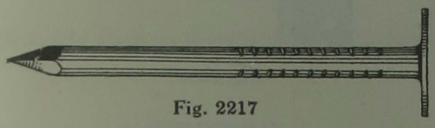


Fig. 2217

SMOOTH FOUNDRY

½ Inch Head

Length, Inches	NO. 8	NO. 9	NO. 10	NO. 11
¾	$0.60	$0.70	$0.80	$0.90
⅞	.50	.60	.70	.80
1	.40	.50	.60	.70
1⅛	.35	.45	.55	.65
1¼	.30	.40	.50	.60
1½	.25	.35	.45	.55
1¾	.25	.35	.45	.55
2	.20	.25	.35	.45
2¼	.15	.20	.30	.40
2½	.15	.20	.30	.40
2¾	.10	.15	.25	.35
3	.05	.10	.20	.30

WIRE NAILS

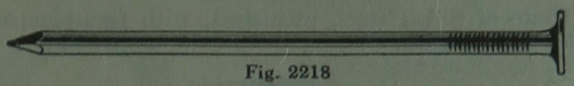


Fig. 2218

SMOOTH BOX

Size	Length, Inches	Wire Number	Approx. Number to Lb.	Extra Over Base, Per 100 Lbs.
2	1	15½	1010	$1.00
3	1¼	14½	635	.70
4	1½	14	473	.50
5	1¾	14	406	.50
6	2	12½	236	.35
7	2¼	12½	210	.35
8	2½	11½	145	.25
9	2¾	11½	132	.25
10	3	10½	94	.15
12	3¼	10½	88	.15
16	3½	10	71	.15
20	4	9	52	.15
30	4½	9	46	.15
40	5	8	35	.15

CEMENT COATED NAILS

BOX

Size	Length, Inches	Number of Nails in Keg	Wire Nos.	Weight Keg, Lbs.	Advance Over Base
2	1	96,200	16½	74	$1.00
3	1⅛	64,600	16	68	.70
4	1⅜	45,500	15½	64	.50
5	1⅝	39,700	15	74	.50
6	1⅞	23,600	13½	77	.35
7	2⅛	19,300	13½	72	.35
8	2⅜	14,000	12½	75	.25
9	2⅝	13,100	12½	78	.25
10	2⅞	8,900	11½	75	.15
12	3⅛	8,700	11½	80	.35
16	3⅜	7,100	11	78	.35
20	3⅞	5,200	10	83	.35
30	4⅜	4,600	10	81	.35
40	4⅞	3,500	9	84	.35

FINE

2	1	120,000	17½	70	1.00
3	1⅛	64,600	16	68	.50

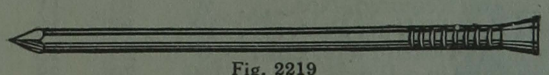


Fig. 2219

FLOORING BRADS

Size	Length, Inches	Number of Nails in Keg	Wire Nos.	Weight Keg, Lbs.	Advance Over Base
6	2	14,500	12	70	$0.20
7	2¼	12,500	12	70	.20
8	2⅜	9,000	11	70	.10
9	2¾	7,800	11	70	.10
10	3	5,900	10	70	.05
12	3¼	4,300	9	70	.05
16	3½	3,450	8	70	.05
20	4	2,600	7	70	Base

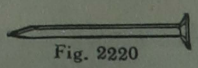


Fig. 2220

BARREL

Length, Inches	Wire Number	Number of Nails in Keg	Weight Per Keg, Lbs.	Advance Over Base
¾	15½	95,000	70	$1.00
⅞	14½	67,200	70	.85
1	14½	55,000	70	.70
1⅛	14½	48,000	70	.60
1¼	14	37,000	70	.50
1⅜	13	26,000	70	.40
1½	13	24,500	70	.30

WROUGHT STEEL HINGES

Made of rolled steel, planished; with fast pins; screw holes countersunk.

Fig. 2221

LIGHT STRAP
NO 900

Length Each Leaf, Inches	3	4	5
Width at Joint, Inches	1⅛	1⅛	1 5/16
Size Screws Required, Nos.	6	7	8
Screws Required, per Pair	12	12	16
Weight per Dozen Pairs, Lbs.	2½	4	6¼
Dozen Pairs in a Barrel	225	150	100
Weight per Barrel, Lbs.	607	604	648
Per Dozen Pairs	**$0.85**	**1.10**	**1.35**

Length Each Leaf, Inches	6	7	8
Width at Joint, Inches	1 9/16	1⅞	1⅞
Size Screws Required, Nos.	9	10	10
Screws Required, per Pair	16	16	16
Weight per Dozen Pairs, Lbs.	9	13	14½
Dozen Pairs in a Barrel	80	50	48
Weight per Barrel, Lbs.	740	669	716
Per Dozen Pairs	**$1.70**	**2.10**	**2.40**

Length Each Leaf, Inches	10	12	14	16
Width at Joint, Inches	2 1/16	2¾	2 13/16	3
Size Screws Required, Nos.	10	12	13	13
Screws Required, per Pair	16	16	16	16
Weight per Dozen Pairs, Lbs.	20	33	48	61
Dozen Pairs in a Barrel	32	16	13	10
Weight per Barrel, Lbs.	666	553	643	630
Per Dozen Pairs	**$3.30**	**4.90**	**6.40**	**7.90**

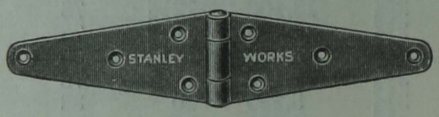


Fig. 2222

HEAVY STRAP
NO. 902

Length Each Leaf, Inches	4	5	6	8
Width at Joint, Inches	1 9/16	1 13/16	2½	3
Size Screws Required, Nos.	9	10	11	12
Screws Required, per Pair	12	16	16	16
Weight per Dozen Pairs, Lbs.	6	10	19	34
Dozen Pairs in a Barrel	100	70	38	20
Weight per Barrel, Lbs.	610	696	742	700
Per Dozen Pairs	**$1.60**	**2.15**	**2.80**	**4.50**

Length Each Leaf, Inches	10	12	14	16
Width at Joint, Inches	3 7/16	4	4½	4 5/8
Size Screws Required, Nos.	14	16	16	16
Screws Required, per Pair	16	16	16	16
Weight per Dozen Pairs, Lbs.	51	82	91	112
Dozen Pairs in a Barrel	12½	8½	6	5
Weight per Barrel, Lbs.	663	666	563	579
Per Dozen Pairs	**$6.80**	**10.40**	**12.20**	**14.00**

HINGE HASPS

Fig. 2223

NO. 912

Plain steel; with plate staples.

Length, Inches	3	4½	6	8
Width at Joint, Inches	1⅛	1⅛	1½	1⅞
Size Screws Required, per Pair	6	7	9	10
Weight per Dozen Pairs, Lbs.	2	2¾	5	7¾
Dozen Pairs in a Barrel	250	180	96	60
Weight per Barrel, Lbs.	520	516	500	500
Per Dozen Pairs	**$0.50**	**.60**	**.80**	**1.05**

WROUGHT STEEL HINGES

Made of rolled steel, planished; with fast pins; screw holes countersunk.

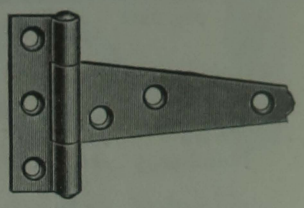


Fig. 2224

LIGHT T
NO. 904

Length, Inches	3	4	5
Width at Joint, Inches	1 1/16	1 1/16	1 3/16
Size Screws Required, Nos.	7	7	8
Screws Required, per Pair	12	12	14
Weight per Dozen Pairs, Lbs.	2¾	3½	4¾
Dozen Pairs in a Barrel	200	130	100
Weight per Barrel, Lbs.	560	471	492
Per Dozen Pairs	**$0.75**	**.80**	**1.00**

Length, Inches	6	7	8	9
Width at Joint, Inches	1¼	1½	1 9/16	1 5/8
Size Screws Required, Nos.	8	9	9	10
Screws Required, per Pair	14	14	14	14
Weight per Dozen Pairs, Lbs.	6¼	8¾	9½	13
Dozen Pairs in a Barrel	80	60	48	40
Weight per Barrel, Lbs.	514	545	471	539
Per Dozen Pairs	**$1.20**	**1.35**	**1.50**	**1.90**

Length, Inches	10	12	14	16
Width at Joint, Inches	1¾	2⅛	2¼	2⅜
Size Screws Required, Nos.	10	11	12	12
Screws Required, per Pair	14	14	14	14
Weight per Dozen Pairs, Lbs.	13½	20½	33	38½
Dozen Pairs in a Barrel	33	22	12	11
Weight per Barrel, Lbs.	442	470	415	340
Per Dozen Pairs	**$2.20**	**3.00**	**3.90**	**5.15**

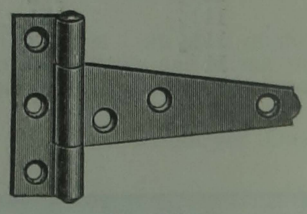


Fig. 2225

HEAVY T
NO. 906

Length, Inches	4	5	6	8
Width at Joint, Inches	1 5/16	1⅜	1 9/16	1¾
Size Screws Required, Nos.	8	8	9	10
Screws Required, per Pair	12	14	14	14
Weight per Dozen Pairs, Lbs.	4¾	6¾	8¾	12
Dozen Pairs in a Barrel	100	65	55	40
Weight per Barrel, Lbs.	493	455	497	500
Per Dozen Pairs	**$0.90**	**1.05**	**1.25**	**1.55**

Length, Inches	10	12	14	16	18
Width at Joint, Inches	2	2 7/16	3⅛	3⅛	3⅛
Size Screws Required, Nos.	11	12	13	14	14
Screws Required, per Pair	14	14	14	14	14
Weight per Dozen Pairs, Lbs.	19	31	45	50	56
Dozen Pairs in a Barrel	25	15	10	7	5
Weight per Barrel, Lbs.	500	481	471	370	300
Per Dozen Pairs	**$2.30**	**3.20**	**4.45**	**5.40**	**5.75**

PADLOCKS

Fig. 2226

Cast bronze case and shackle, unpolished, with bronze inside parts; spring drop cover over keyhole; especially adapted for railway uses; self-locking; key cannot be withdrawn until shackle is securely locked. Size, $2\frac{3}{8}$x$3\frac{3}{8}$x$\frac{5}{8}$ inches. Furnished with 2 keys.

Per Dozen

NO. 936—Weight per Dozen, $8\frac{3}{4}$ Lbs. **$18.30**

Similar to No. 936, but with a 10 inch chain made of No. 4 steel wire for fastening the lock where it is to be used.

Per Dozen

NO. 1036—Weight per Dozen, $10\frac{1}{2}$ Lbs. **$20.10**

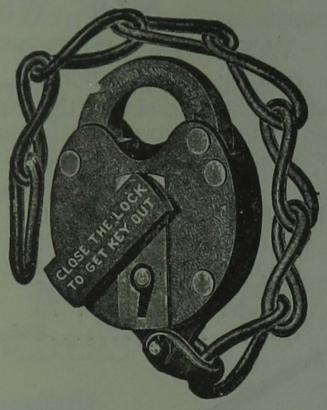


Fig. 2227

Fig. 2228

Cast bronze polished case, with raised polished letters; black enamel relief; self-locking spring shackle; wrought brass inside works; 6 secure levers; 2 nickel plated flat steel keys to each lock; 4096 changes. Can be master keyed.

Per Dozen

NO. 5—Size, $2\frac{1}{4}$ Inches; Weight per Dozen, $5\frac{1}{4}$ Lbs. **$18.00**

Fig. 2229

Similar to No. 5, but with a 9 inch nickel plated chain made of No. 3 steel wire.

Per Dozen

NO. 6—Size, $2\frac{1}{4}$ Inches; Weight per Dozen, $5\frac{3}{4}$ Lbs. **$19.50**

All Above, One-half Dozen in a Box

PADLOCKS

Fig. 2230

Ivory black steel case; nickel plated steel rod spring shackle, self-locking; snaps open to a quarter turn position when unlocked; two nickel plated corrugated steel keys; 12 changes.

Per Dozen

NO. 200—Size, 2 Inches; Weight per Dozen, $3\frac{1}{2}$ Lbs. **$5.20**

All brass case; satin finish spring shackle, self locking; six secure levers; two flat steel nickel plated keys; 150 changes.

Per Dozen

NO. 658—Size, $1\frac{1}{4}$ Ins.; Weight per Dozen, $2\frac{1}{2}$ Lbs. **$12.70**

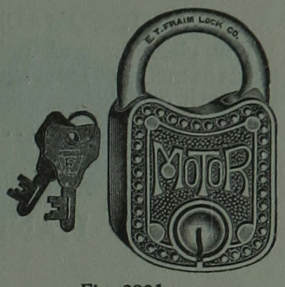


Fig. 2231

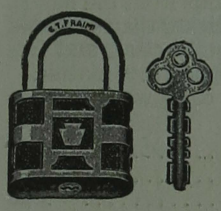


Fig. 2232

Polished cast brass, self-locking spring shackle; spacing of shackle, closed $1\frac{1}{16}$x$\frac{3}{4}$ inch; warded; six changes; 2 corrugated steel keys with each lock.

Per Dozen

NO. 474—Weight per Dozen, $1\frac{1}{4}$ Lbs. **$5.40**

SCANDINAVIAN

All malleable iron, brown japanned; two flat steel keys to each lock; six changes; interlocking tumblers.

NOS.	No. Tumblers	Wgt. per Doz., Lbs.	Per Dozen
225	3	$3\frac{1}{4}$	$8.00
$225\frac{1}{2}$	3	$4\frac{1}{4}$	9.50
226	4	6	10.00
$226\frac{1}{2}$	4	$6\frac{5}{6}$	10.50
227	6	9	10.00
$227\frac{1}{2}$	6	$9\frac{3}{4}$	11.50
228	8	8	16.00

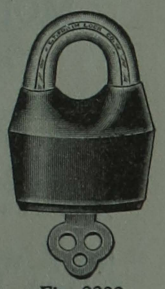


Fig. 2233

Fig. 2234

Cast bronze case; polished raised surface; unpolished background; polished self-locking spring shackle; brass lever tumbler; all different in a dozen; two fluted nickel bronze, coined, gold plated bow keys to each lock.

NOS.	813	823	833
Size, Inches	1	$1\frac{1}{4}$	$1\frac{1}{2}$
Changes	48	48	48
Lever tumblers	3	3	3
Weight per Dozen, Lbs.	$1\frac{1}{2}$	$2\frac{1}{2}$	4
Per Dozen $			

NOS.	843	853	863
Size, Inches	$1\frac{3}{4}$	2	$2\frac{1}{4}$
Changes	72	144	144
Lever Tumblers	4	4	4
Weight per Dozen, Lbs.	$5\frac{1}{2}$	$7\frac{1}{2}$	$9\frac{1}{4}$
Per Dozen $			

METAL POLISH

SOLARINE

Apply with cloth and finish with flannel or chamois skin: for silver, brass, nickel, tin, zinc and all metal surfaces. Tin can with screw cap.

Size, Pints	Weight Per Dozen, Lbs.	Per Dozen
½	10	$3.00
1	14	5.34
2	34	9.00
4	76	15.00
8	140	27.00

Fig. 2235

PUTZ-POMADE

For cleaning and polishing all kinds of metal or glass surfaces; free from grit or acids.

One-Lb. Can, per Lb..... $0.50

Fig. 2236

HAND CLEANER

FLASH

For removing dirt, grease, oil, paint, ink and stains of all kinds from the hands.

Cleans better and quicker than soap and leaves the skin absolutely clean and free from injurious and unhealthy matter.

Paste form, in tin cans weighing one pound.

	Each
1-Lb. Can	$0.10
1½-Lb. Can	.15
2-Lb. Can	.25
11-Lb. Can	1.00

Fig. 2237

MOP HEADS

COTTON

Good grade four-ply soft twisted cotton strands; each strand 3/16 inch in diameter; sewed together at center by ¾-inch linen band.

	Per Dozen
NO. 1—Weight per Dozen, 12 Lbs.	$4.00

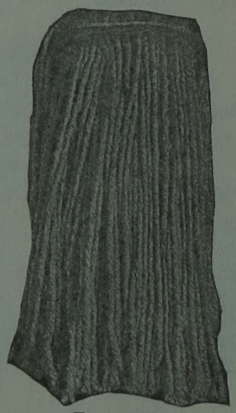


Fig. 2238

MOP HANDLES

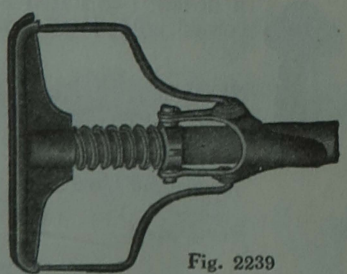


Fig. 2239

Natural finish hardwood handle, ⅞ inch in diameter, riveted to iron socket; cast iron and steel trimmings, copper finished.

	Per Dozen
NO. 2—Length Over All, 48 Inches; Width of Jaws, 5¾ Inches. Weight per Dozen, 14 Lbs.	$4.00

COTTON WASTE

Fig. 2240

All material used in manufacturing this waste is procured from mills selected as producers of particular yarns and cloth. Carefully handpicked, graded, to extract extraneous matter. Packed in bales of 25-50, 100, 250 and 500 Lbs. each. Clean burlap and new steel bands, is weighed separately to insure a maximum of 6 per cent tare of total weight. Made in six white and six colored grades.

Prices on Application.

MOP WRINGERS

VANCO GALVANIZED

Galvanized heavy pressed steel; closes up almost tight; fits any pail; not top heavy; wrings mop dry with least effort.

	Per Dozen
NO. 87—Height Without Handle, 8 Inches; Wrings All Mops 16 Ounces and Smaller; Shipping Weight per Dozen, 70 Lbs.	$24.00

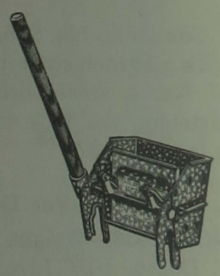


Fig. 2241

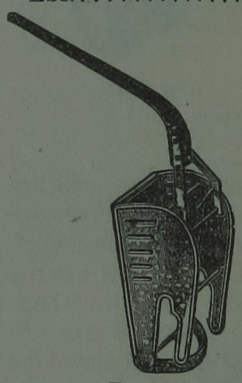


Fig. 2242

Galvanized heavy pressed steel; fits any pail; does not upset pail nor injure light pails; wrings mop dry with little effort; galvanizing after assembling closes all seams and openings; circular band at bottom of wringer presses against inside of pail and wide flanges on each side, that bear on outside.

	Per Dozen
NO. 88—Height without Handle, 11 Inches; Wrings All Mops up to 20 Ounces; Shipping Weight per Dozen, 150 Lbs.	$30.00
NO. 89—Janitor's Size, 15½ Inches; Wrings All Mops from 20 to 36 Ounces; Shipping Weight per Dozen, 190 Lbs.	35.00

One-half Dozen in a Crate

FLOOR SCRUBBERS

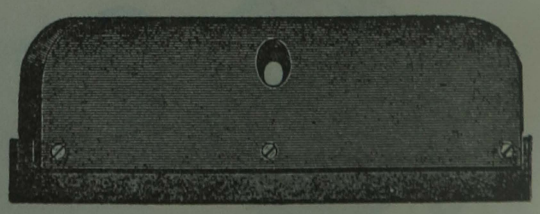


Fig. 2243

Polished hardwood block, 3¼x1⅛ inches; ¼-inch rubber strip inserted and fastened with screws.

Length, Inches	12	14	16
Weight per Dozen, Lbs.	7	8	10½
Per Dozen	$4.50	5.00	5.50

Length, Inches	18	20	24	30
Weight per Dozen, Lbs.	13	15	17	20
Per Dozen	$6.00	6.50	9.00	12.00

COPYING PRESSES

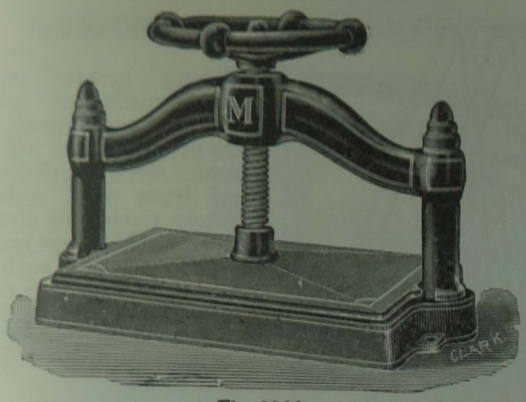


Fig. 2244

Cast iron arch, base and follower plate; steel columns and screw; black japanned finish.

NOS.	Size Follower, Inches	Weight Each, Lbs.	Each
112	10x12½	60	$21.00
115	10x15½	80	24.00
116	11x16½	89	30.00
118	12x18½	125	38.00
120	15x20½	215	47.00
121	16x20½	275	56.00
122	18x22½	320	64.00
124	20x24½	350	78.00

BAG HOLDERS

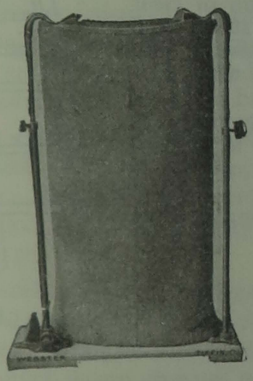


Fig. 2245

Jaws are of malleable iron, fitted to adjustable pipe and rod standards, one of which is hinged to the base, with a high tension spring. Holds bags large or small.

Complete, with base board $5.00

COAL HODS

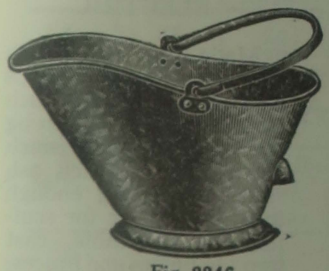


Fig. 2246

Open pattern; round bottoms; half oval japanned bails; plain bodies, galvanized; wire bound bottom and top; rear handle and ears riveted.

NOS.	Width, Inches	Weight Per Dozen, Lbs.	Per Dozen
615	15	26	$8.35
616	16	30	9.25
617	17	34	10.00
618	18	38	10.90
619	20	50	14.75

SCOOPS

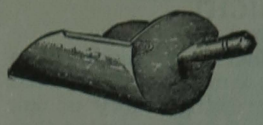


Fig. 2247

Heads and handles are made of hard, well seasoned wood, and the bowls of heavy galvanized steel.

NOS.	Length, Inches	Width, Inches	Weight Per Dozen, Lbs.	Per Dozen
3B	8	5	¾	$4.80
4B	9	5¾	⅞	6.00
5B	10	6½	1⅛	7.20
6B	11	7¼	1⅞	8.40

Fig. 2248

Made of annealed steel, xxxx tin or galvanized steel. The turned wood handle is placed above the load instead of behind, as in other types.

NOS.	Weight Each, Lbs.	xxxx Tin, Each	Black Steel, Each	Galv. Steel, Each
8	1	$0.60	$0.75	$0.85
10	1¼	.65	.85	1.00
12	1¾	.75	1.00	1.10
14	2¼	1.00	1.25	1.35

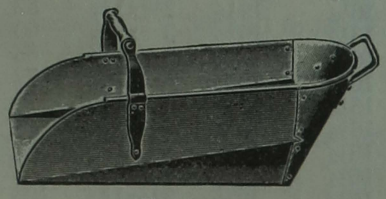


Fig. 2249

Strongly made of blue annealed steel. Front handle of turned wood; back handle of wrought iron. Light and rigid, with excellent wearing qualities.

NOS.	Capacity, Bushels	Weight Each, Lbs.	Each
1	½	7	$2.50
2	1	10	3.00

COAL STOVE SHOVELS

Fig. 2250

One piece, 20 gauge, stamped sheet steel, black japanned; 1 inch, half-round handle; 7x4¾ inch pan; entire length, 15 inches.

NOS.	80	280
Case Lots, Dozen	24	12
Case Weights, Lbs.	125	85
Finish	Japanned	Galvanized
Per Gross	$9.90	14.50

LADDERS

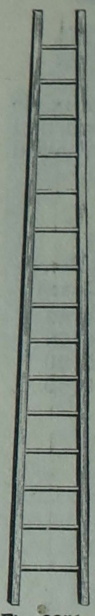


Fig. 2251

STRAIGHT

These straight ladders are made from square edge, dressed white spruce selected timbers with second growth hickory or oak hand shaved rungs, wedged to sides so that no extra reinforcement is required. Sides are 2¾x1⅜ inches. Made in 8 to 22-foot lengths.

Length, Feet	Width Top, Inches	Width Bottom, Inches	Weight Each, Lbs.
8	13¾	15¾	12
10	13¾	16¾	15
12	13¾	16¾	18
14	13¾	17¼	21
16	13¾	17¾	28
18	13¾	18¼	31
20	13¾	18¾	36
22	13¾	19¼	41

EXTENSION

Made in two sections from clear white spruce with rungs of hand split and hand shaved straight grained oak and ash; malleable iron automatic spring locks; 2 hand forged guide irons each on top and bottom of the sliding section; furnished with rope and pulley.

Made from 20 to 44 feet long.

Length, Feet	Width Top, Inches	Width Bottom, Inches	Size Sides, Inches	Weight Each, Lbs.
20	16¼	19½	2¾x1⅜	30
22	16¼	19½	2¾x1⅜	38
24	16¼	19½	2¾x1⅜	40
26	16¼	19½	2¾x1⅜	47
28	16¼	19½	2¾x1⅜	52
30	16¼	19½	3 x1⅜	60
32	16¼	19½	3 x1⅜	65
34	16¼	19½	3 x1⅜	72
36	16¼	19½	3 x1⅜	75
38	16¼	19½	3 x1⅜	77
40	16¼	19½	3 x1⅜	81
42	16¼	19½	3½x1⅜	92
44	16¼	19½	3½x1⅜	103

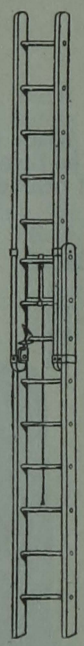


Fig. 2252

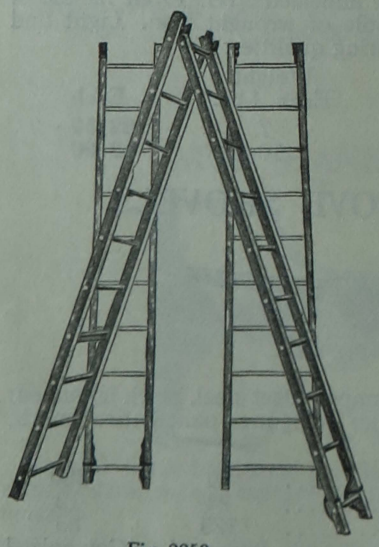


Fig. 2253

COMBINED STEP AND EXTENSION

Made of Norway pine sides and hickory rungs, fitted with an improved automatic catch or malleable iron hinge. Inner section can be removed while in an upright position, forming two single ladders and still without the possibility of collapsing while in use as a step ladder. Made in lengths from 12 to 30 feet, inclusive. All equipped with rope and pulley.

All Prices on Application

LADDERS

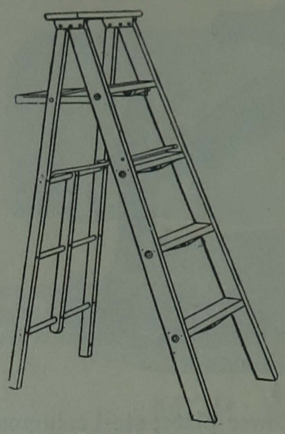


Fig. 2254

STRONGEST

Strong general purpose ladder; made of selected materials throughout; side rails of spruce are wide and strong; steps reinforced by steel truss rods; wide top securely riveted to steel top braces; back or legs steadied by a rung opposite each step; rungs reinforced at the center; ladders 4 feet or longer are furnished with shelf for bucket; furnished in lengths up to 16 feet.

SAFETY-FIRST

Sturdily built to stand rough usage; made of clear spruce, 1¼-inch stock, well braced; steps mortised in side rails and trussed with steel rods; spreaders and hinges of 1¼-inch iron; heavy rungs reinforce back or legs opposite each step; all parts securely riveted.

Furnished in lengths from 6 to 20 feet.

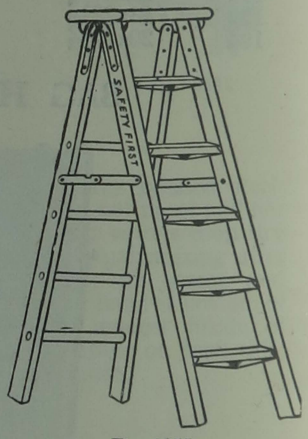


Fig. 2255

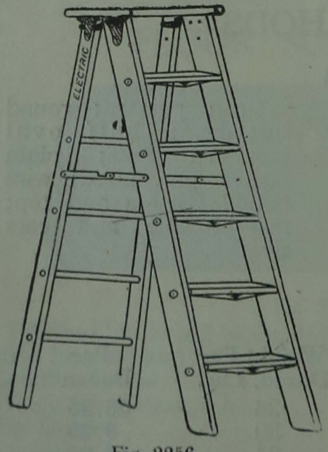


Fig. 2256

ELECTRIC

Made from spruce with wide side rails; wide steps well grooved in sides; each step trussed with a strong rod; back legs of 1¾-inch stock with 1⅛-inch ash rungs are strong enough to hold a plank for scaffolding; malleable cast iron top hinges and braces; steel side spreaders.

Made in sizes 4 to 16 feet.

All Prices on Application

BALING PRESSES

ECONOMY—POWER DRIVEN

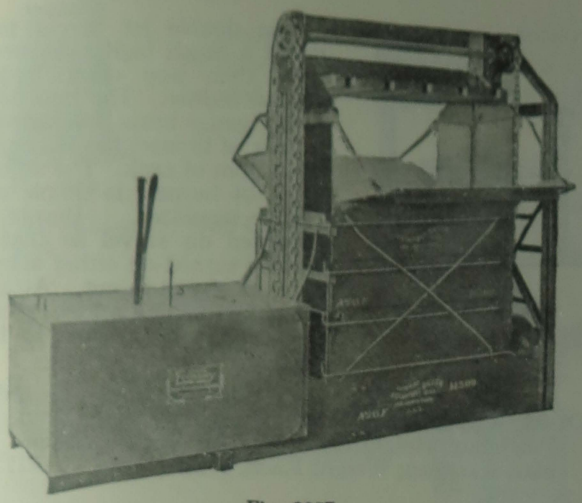


Fig. 2257

Constructed entirely of steel. Equipped with automatic safety shut off which prevents any overstrain on baling mechanism or motor. This device operates automatically and is governed entirely by pressure on bale. The same pressure is exerted upon each charge so that both top and bottom of bale is tight and equally compressed. The plunger of all the presses except of the small hand power balers can be rapidly forced to the bottom of baling case, resulting in speed and saving in labor. Presses are self-contained and may be mounted on wheels or casters.

As the baling case opens from both sides the finished bales can be easily wired or burlapped and taken out from either side. The bale when completed is the right height from the floor to roll out directly on a truck without first dropping on the floor.

Designed to work under low ceilings. Will handle all classes of material quickly and take in at both side hoppers at the same time. Equipped with patent automatic shut-off, long stroke quick return plunger, non-breakable chain and reinforced baling chamber.

BELT DRIVEN

NOS.	Makes Bales			Weight Each, Lbs.	Each
	Length, Inches	Width, Inches	Height, Inches		
5	45	24	1–38	3000	$900.00
55	45	30	1–40	3500	1,050.00

DIRECT CONNECTED

NOS.	Makes Bales			Weight Each, Lbs.	Each
	Length, Inches	Width, Inches	Height, Inches		
6	45	24	1–38	3000	$1025.00
66	45	30	1–40	3500	1200.00

Balers for preparing goods for shipment and for baling any balable material, including hay, wood pulp, hemp, shavings, scrap metal, tin cans, etc., can be furnished. For these or for balers to meet special requirements, prices will be quoted on application.

BALING PRESSES

ECONOMY—HAND OPERATED

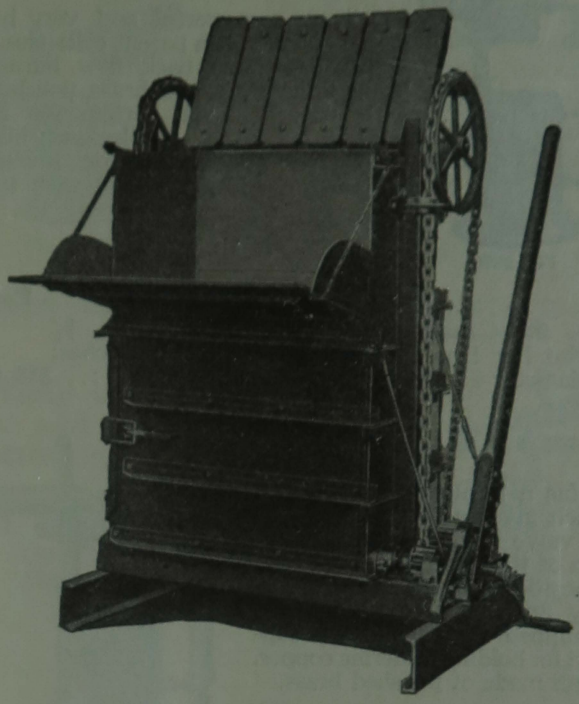


Fig. 2258

Made entirely of steel, have automatic opening top. By this mechanism the compression plunger lifts up and folds back automatically, leaving the top of baling case open to receive material. Material can be dropped into baler from floor above as fast as it accumulates. Attached crank will rapidly raise or lower the compression plunger before the slower acting lever pressure is applied.

NOS.	36	45
Makes Bales, Inches	36x20x1 to 38	45x24x1 to 38
Weight of Press, Lbs.	1000	1600
Each	$250.00	310.00

NOS.	54	22
Makes Bales, Inches	54x24x1 to 44	20x24x1 to 32
Weight of Press, Lbs.	2500	800
Each	$450.00	275.00

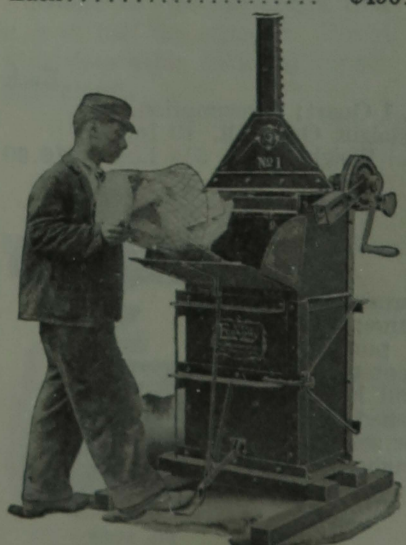


Fig. 2259

For use in schools, hotels, apartment houses, office buildings, public buildings, homes, hospitals, etc. Equipped with fire tight baling case and automatic closing hopper. The attached crank will rapidly lower or raise the plunger before the slower-acting lever is applied.

	Each
NO. 1—Makes bales 16x20x30 Inches; Weight of Press, 400 Lbs.	$70.00

GASOLINE BLOW TORCHES

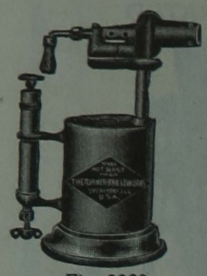


Fig. 2260

Delivers a powerful and very hot flame. Made with patent coil; closed under generator; back flow burner. Tank is heavy gauge brass, polished, with funnel-shaped bottom for filling; fitted with non-leaking filler plug. No attachment for holding soldering coppers furnished with this torch.

Each

NO. 20—Capacity, 1 Quart; Consumption, ¾ Pint Per Hour; Height Over All, 11¼ Inches; diameter 4 Inches; Weight Each, 4 Lbs. $18.80

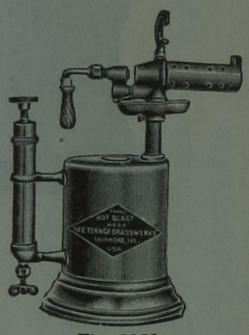


Fig. 2261

Has a burner of high power which gives a hot flame. The air valve is located at the bottom of the pump barrel in such a position that it is out of the way and not easily damaged. Equipped with hook and support for holding soldering copper. Tank made of polished brass.

NO. 21—Capacity, 1 Quart; Consumption, ½ Pint Per Hour; Height Over All, 10 Ins.; Diameter, 4 Inches; Weight Each, 3¼ Lbs. Each $18.00

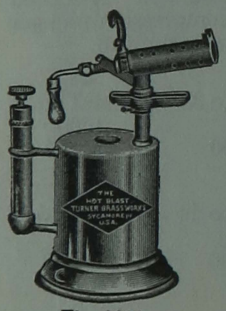


Fig. 2262

Has new style of burner which superheats and properly mixes the air before it enters the combustion chamber; free from wind and the cold air currents of ordinary burners. Supplied with hook and support for soldering copper. Tank and pump made of polished brass.

Each

NO. 202—Capacity, 1 Quart; Consumption, ½ Pint Per Hour; Height Over All, 10 Inches; Diameter 4 Inches; Weight Each, 5½ Lbs. . . $16.00

Fig. 2263

Has new type of burner which gives a hot, blue flame; automatic spring valve pump in handle; has attachment to prevent tipping and will lie flat in tool box. Furnished with hook and support for soldering copper. Tank and pump made of polished brass.

Each

NO. 419—Capacity, 1 Pint; Consumption, ¼ Pint Per Hour; Height Over All, 8½ Inches; Diameter 1¾ Inches; Weight Each, 2¾ Lbs. $18.40

GASOLINE BLOW TORCHES

DOUBLE JET

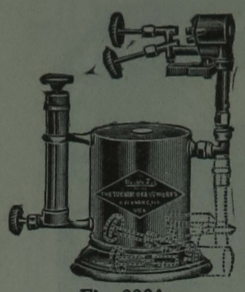


Fig. 2264

The double jet burner produces a much higher degree of heat than any other hydrocarbon burner. The tank is of heavy gauge brass polished; the burner of bronze; has filler plug in bottom of tank. The adjustment of burners is simple and easily regulated. Burner is mounted on swivel so that it can be turned on either side of tank as shown in cut. Attachment for holding soldering copper cannot be applied to this torch.

Each

NO. 93—Capacity, 1 Quart; Consumption, ¾ Pint Per Hour; Height Over All, 10¾ Inches; Diameter, 4 Inches; Weight Each, 5 Lbs. $17.10

DOUBLE JET

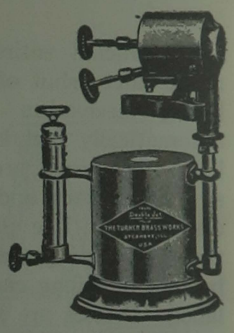


Fig. 2265

Has a large powerful burner, the size of flame at burner being ¾ inch. It is supplied with a windshield so it can be used for heavy outdoor work in the strongest wind. Soldering copper holding attachment cannot be applied to this torch. Tank and pump made of polished brass.

Each

NO. 97—Capacity, 1 Quart; Consumption, 1½ Pints Per Hour; Height Over All, 11¼ Inches; Diameter, 4 Inches; Weight Each, 4½ Lbs. $23.00

KEROSENE OR GASOLINE

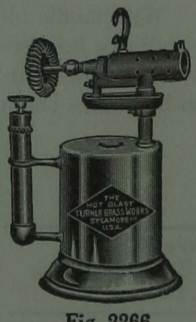


Fig. 2266

For kerosene or gasoline. Burns kerosene oil as well as gasoline or a mixture of both. A powerful, blue flame is produced several hundred degrees hotter than with gasoline in any single jet torch. The kerosene is transformed into gas under perfect conditions and burned without odor or carbon deposit. Supplied with hook and support for soldering copper.

Each

NO. 426—Capacity, 1 Quart; Consumption, ½ Pint Per Hour; Height Over All, 10¼ Inches; Diameter, 4 Inches; Weight Each, 3¾ Lbs. $18.40

ALCOHOL BLOW PIPE TORCHES

An adjustable blow pipe pocket torch for alcohol. Nickel plated brass. Has tight fitting metal cap.

Each

NO. 58—Capacity, ¼ Pint; Consumption, ⅛ Pint Per Hour; Height Over All, 6½ Inches; Diameter, 1¾ Inches; Weight Each, 10 Ounces. . . $8.00

Fig. 2267

GASOLINE BLOW TORCHES

Fig. 2268

Strongly built and finely finished. Produces a strong hot blast and can be used in hard wind or extreme cold.

Each

NO 31—Capacity, One Quart; Weight Each, 4¼ Lbs.....$15.20

Fig. 2269

Has the same features as No. 31 with the added advantage to repair men of a hook and support for soldering copper.

Each

NO. 32—Capacity, One Quart; Weight Each, 4¼ Lbs.....$16.00

Fig. 2270

Fitted with latest improved burner which protects the gas from wind. Gives a hot, blue flame and consumes but little gasoline; has automatic air pump with check valve. Tank and pump made of polished brass.

Each

NO. 37—Capacity, One Pint; Weight Each, 2¾ Lbs.....$13.60

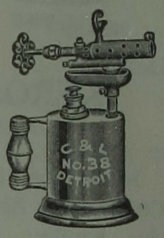


Fig. 2271

Similar to No. 37, but has hook and support for soldering copper. Tank and pump made of polished brass.

Each

NO. 38—Capacity, One Pint; Weight Each, 2¾ Lbs.....$14.40

Fig. 2272

Light yet strongly built. Has pump in handle the same style as pump in tank torches; check valve is actuated by springs and works automatically in recess of bottom handle casting. An air tube is attached to lower handle casting through which the air enters the top of tank above the gasoline; impossible for gasoline to get into pump. A double shouldered needle is used in the burner, affording quick and positive adjustment. Equipped with hook and support for soldering copper. Tank and pump made of polished brass.

Each

NO. 19—Capacity, One Pint; Weight Each, 3 Lbs..$13.60

GASOLINE BLOW TORCHES

Fig. 2273

The tank is of heavy seamless drawn brass, reinforced; automatic brass pump, fitted with double springs forms the handle; burner is of bronze metal; produces a blue, hot flame.

Each

NO. 107—Capacity, One Quart; Weight Each, 4 Lbs. $14.40

Similar to No. 107, but fitted with solid hook and support for soldering copper.

Each

NO. 108.—Capacity, One Quart; Weight Each, 4 Lbs.....$15.20

Fig. 2274

Fig. 2275

Not as powerful as the higher grade torches, but will give good results on ordinary work. The pump is fitted with double spring check valve which closes off the air automatically after each stroke of the plunger. Supplied with detachable soldering copper attachment.

Each

NO. 120—Capacity, One Quart; Weight Each, 4 Lbs.....$13.60

Similar to No. 120 except that it is of half the capacity. Fitted with detachable soldering copper attachment.

Fig. 2276

Each

NO. 122—Capacity, One Pint; Weight Each, 3 Lbs. $12.00

Fig. 2277

An oblong torch carefully constructed; fitted with side support so it will not tip over; has special burner and automatic pump in handle.

Each

NO. 47—Capacity, One Pint; Size, 5 Inches Long; 1⅞ Inches Wide; 8 Inches High; Weight Each, 3¾ Lbs.....$17.60

GASOLINE BLOW TORCHES

DETROIT

Fig. 2278

Powerful burner of special design, giving good service out or indoors. Pump is of simple construction; reinforced top; handles of wire. Tank of heavy polished brass.

Each

NO. 1—Capacity, One Quart; Weight Each, 3⅞ Lbs. $10.00

Fig. 2279

Powerful improved burners; pump of strong construction; hook and support for holding soldering coppers. Heavily reinforced brass tank.

Each

NO. 2—Capacity, One Quart; Weight Each, 4 Lbs. $10.50

Fig. 2280

A small size torch similar to No. 1. Built especially for repair men. Works equally well in or out of doors and is light to carry.

Each

NO. 3—Capacity, One Pint; Weight Each, 2¾ Lbs.... $9.00

Of highest quality material and best workmanship. The burner gives a strong heat with small gasolene consumption. Has solid hook and support for soldering coppers; wire handles and reinforced tank.

Each

NO. 4—Capacity, One Pint; Weight Each, 2⅞ Lbs.....$9.50

Fig. 2281

Fig. 2282

Equipped with strong, reinforced tank; has powerful burner that gives a hot blue flame. Has a strongly constructed pump. Handle is of wire and stays cool.

Each

NO. 5—Capacity, One Quart; Weight Each, Lbs. $9.00

GASOLINE BLOW TORCHES

DETROIT

Fig. 2283

Burner is of special material and design; produces a blue flame of great power and heat. Has hook and support for holding soldering coppers. Has reinforced tank. Every part solid and durable.

Each

NO. 6—Capacity, One Quart; Weight Each, 4 Lbs. $9.50

A small torch of economical gasolene consumption. Special design burner. Has reinforced tank and wire handles.

Each

NO. 7—Capacity, One Pint; Weight Each, 2¾ Lbs., $8.50

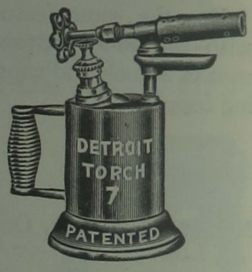


Fig. 2284

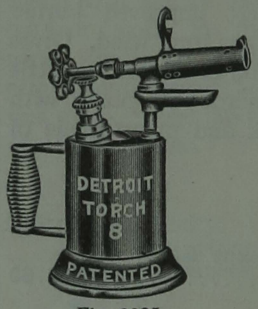


Fig. 2285

A small torch for all practical purposes. Has powerful blue flame burner; strong pump; hook and support for soldering coppers. Wire handle.

Each

NO. 8—Capacity, One Pint; Weight Each, 2⅞ Lbs..$9.00

KEROSENE BLOW TORCHES

"ALWAYS RELIABLE"

Made of high-grade material throughout; fitted with a pump in the handle; improved type of burner gives a very hot blue flame.

Each

NO. 35—Capacity, One Quart; Weight Each, 4¼ Lbs....$20.40

NO. 35P—Capacity, One Pint; Weight Each, 3½ Lbs..... 18.40

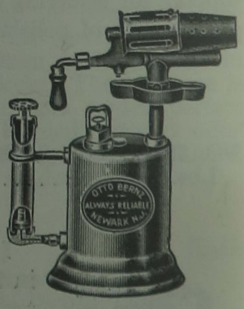


Fig 2286

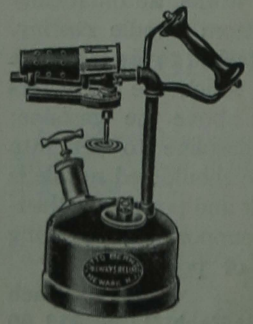


Fig. 2287

Tank made of seamless drawn steel; fitted with funnel and filler screw with dust-proof cap attached. Improved type of pump and burner.

Each

NO. 39—Capacity, One Gallon; Weight Each, 8¾ Lbs. $41.30

GASOLINE FIRE POTS

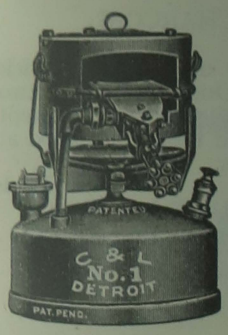


Fig. 2288

Heavy gauge seamless drawn steel tank, tinned inside and out; fitted with cushion protection band at base and with large funnel and filler plug having dust-proof cap. Burner produces a blue flame entirely free from smoke, easily regulated and will give satisfactory results in windy or cold weather; has swivel, which permits moving flame up or down and is fitted with clean-out plugs. A pair of 12-lb. soldering coppers can be heated and a pot of lead melted at the same time. Top section of pot can be removed.

Each

NO. 1—Capacity, 7 Pints; Size of Fire Pot, 12½ Inches High, 9½ Inches Diameter at Base and 6¾ Inches at Top; Weight Each, 11 Lbs. . . $27.20

Similar to No. 1, but smaller in size. Top will hold a pair of 8-lb. soldering irons and a 5-inch metal pot at the same time. By removing the top section the base may be used as a torch or brazing fire.

Fig. 2289

Each

NO. 5—Capacity, 5 Pints; Height Over All, 12½ Inches; Diameter, at Base, 8⅜ Inches, at Top, 6 Inches; Weight Each, 10¼ Lbs. $24.80

Fig. 2290

Tank constructed of heavy gauge seamless drawn steel, reinforced, tinned outside and inside; fitted with cushion protection band around base and with large funnel and filler plug having dust-proof cap. Will hold a pair of 12-lb irons and a metal pot at the same time. The burner has two heating surfaces; the gas is superheated, producing an intensely hot blue flame, burning from each side to the center. A sub-flame for generator permits flame to be turned low. Flame is protected by hood.

Each

NO. 71—Capacity, 7 Pints; Weight Each, 14¼ Lbs. $27.20

GASOLINE FIRE POTS

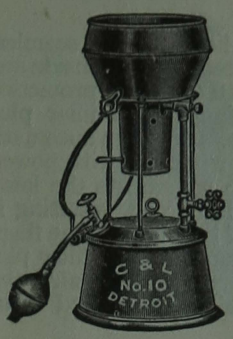


Fig. 2291

The tank is made of heavy galvanized iron fitted with galvanized cast iron top plate and bottom ring. All small or light castings are malleable iron or brass. The coil is made of extra heavy pipe, and the burner of steel. The needle point valves, which are fitted with stuffing holes, are always tight and give perfect control of the fire.

Each

NO. 10—Capacity, 1 Gallon; Weight 9¾ Lbs. $15.00

Similar to No. 10, but is fitted with automatic brass air pump which is more durable than a bulb and enables the operator to use more air, thereby producing a blue blast flame that is intensely hot.

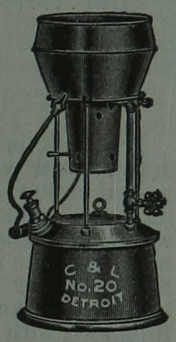


Fig. 2292

Each

NO. 20—Capacity, 1 Gallon; Weight, Each, 9¾ Lbs. $16.60

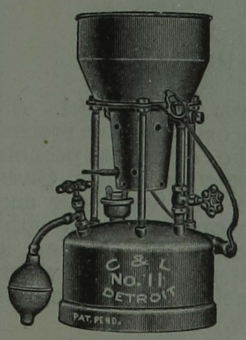


Fig. 2293

Produces a steady blue, hot flame. Air pressure supplied by rubber bulb. The tank is made of heavy gauge seamless drawn steel, reinforced, tinned inside and out; fitted with cushion protection base band; large funnel with filler plug having dust-proof cap. Has extra heavy uprights, large valve, heavy malleable top plate and one-piece steel shield.

Each

NO. 11—Capacity, 1 Gallon; Weight Each, 9¾ Lbs. $19.60

Similar to No. 11 except that it is fitted with automatic brass pump instead of the rubber bulb.

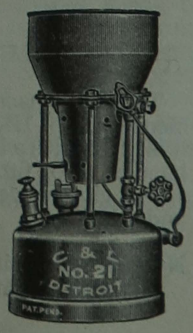


Fig. 2294

Each

NO. 21—Capacity, 1 Gallon; Weight Each, 9¾ Lbs. . . $21.20

KEROSENE FIRE POTS

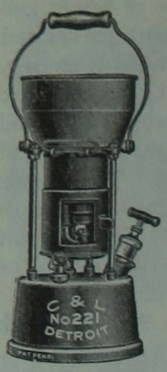


Fig. 2295

The tank is of heavy gauge seamless drawn steel, reinforced. Tinned inside and out and fitted with cushion protection base band; large funnel and filler plug with dust proof cap. Has large automatic brass pump. Burner is made with powerful generator which superheats the kerosene gas before it is burned, resulting in maximum degree of heat and a blue flame free from odor or smoke. The filler plug at top of tank is made with an air valve which releases the air pressure and extinguishes the flame.

Each

NO. 221—Capacity, 1 Gallon; Weight Each, 12 Lbs. $33.60

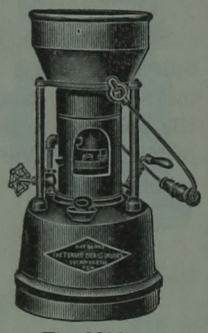


Fig. 2296

The tank is made of seamless, drawn steel with a steel band welded around bottom to permit furnace to stand on uneven ground without tipping over. Has extra heavy upright rods and large filler inlet. Burner is constructed to burn either kerosene or gasolene. Equipped with drawn steel hood.

Each

NO. 83—Capacity, 7 Pints; Weight Each, 9¼ Lbs. $33.60

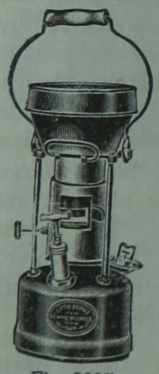


Fig. 2297

ALWAYS RELIABLE"

Made of seamless drawn steel. All joints are welded by oxy-acetylene process which produces the strongest possible joint. Fitted with patented burner. Gives a blue clear flame free from odor and smoke. The burner can be cleaned without taking furnace apart. A ring is attached to the bottom of reservoir, which prevents bottom weld from wearing off and causing leakage.

Each

NO. 1B—Capacity, 1 Gallon; Weight Each, 11 Lbs. $33.60

FOR TELEPHONE WORK

The 2B furnace has the same improvements as No. 1B, with the exception that it is fitted with a large top plate, shield and handle; also fitted with brazed burner which gives a clear, hot flame; smokeless and odorless.

Each

NO. 2B—Capacity, 1 Gallon; Weight Each, 13½ Lbs. $37.60

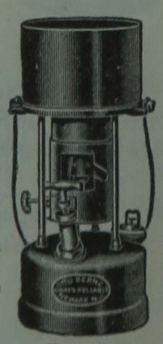


Fig. 2298

TINNERS' FIRE POTS

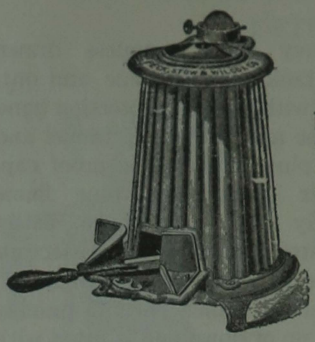


Fig. 2299

CHARCOAL

Made of cast iron, brick lined. Draft door is in two sections. The fire is kept clear and the draft is good at all times.

Each

NO. 781—Weight Each, 15 Lbs. ..... $...

Price on Application

GAS BLOW TORCHES

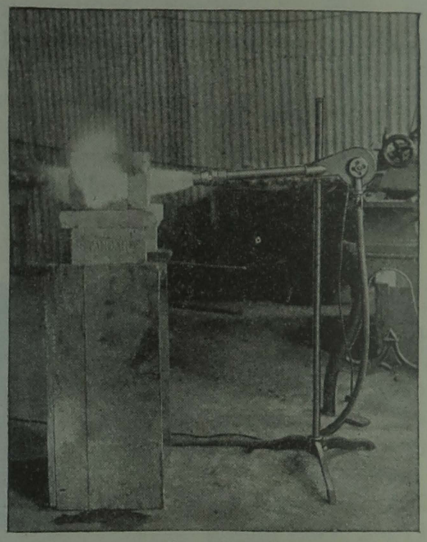


Fig. 2300

For heating improvised furnaces and for hardening, tempering, annealing, forging and brazing; for making shrink fits, pre-heating for acetylene welding, babbitting, removing babbitt from bearings, melting various metals, making pattern castings, straightening bars, shafts, frames, axles, crank shafts in center, bending tubing, heating rivets, etc., It requires neither engine, compressor nor any special alteration of equipment. It is self-contained, requiring only connection with the electric light socket and gas line to produce a clean, even temperature up to 2500 degrees Fahrenheit. Instantly adjusted to any position or angle. Can be carried anywhere in one hand. Consumes from 50 to 180 cubic feet natural gas and 75 to 240 cubic feet artificial gas per hour.

Can be supplied with straight, 45 degree or 90 degree burner as desired.

NOS.	1A	1B	1C
Type of Burner	Straight	45 degrees	90 degrees
Weight Each, Lbs.	30	30	30
Each	$48.00	48.00	48.00

In ordering, state voltage and cycles.

FURNACE NOZZLES

Fig. 2301

For Nos. 1A and 1B torch in connection with heating small hardening and melting furnaces. Nozzle prevents ruining burner. Gas is projected into furnace and does not burn at end of nozzle.

Each

NO. 1 ..... $1.00

OIL BURNING BRAZING FORGES

HAUCK

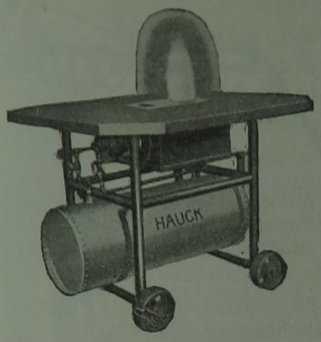


Fig. 2302

This type of forge eliminates noxious gases, smoke and ashes. Burns any grade of fuel, crude or kerosene oil, in connection with compressed air from 20 to 100 pounds pressure. The burner is of the latest type, giving complete combustion to the oil before entering the furnace. It is especially adapted for brazing, annealing, and general blacksmithing. Forges can be furnished with or without wheels. Can also be supplied with hand pump type burners. Consumes kerosene oil only when compressed air is not available.

NOS.	Capacity of Tank, Gal.	Size of Table, Inches	Height, Inches	Oil Consumption per Hour, Gal.
4F	16	34x40	34	2
5F	15	26x34	34	1½
6F	15	20x30	34	1

Prices on Application

PORTABLE KEROSENE BURNERS

HAUCK

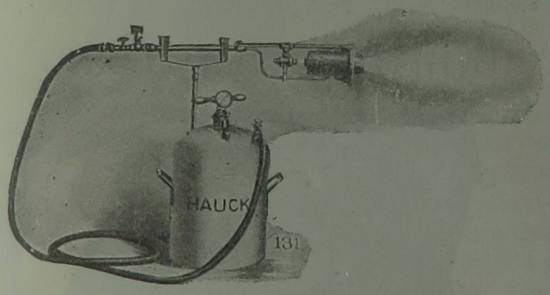


Fig. 2303

Hand Pump Type

For kerosene only. Has a quick acting hand pump, built inside tank. The flame is intense and easily regulated. The burner operates about five hours with a few strokes of pump. Stands furnished when ordered.

NOS.	Capacity of Tank, Gals.	Length of Hose, Ft.	Oil Consumption per Hour, Gals.	Weight Each, Lbs.
7A	5	6	½	60
7	10	12	1	80
8	12	12	2	95
9	15	12	3	110

Prices on Application

PORTABLE OIL TORCHES

HAUCK

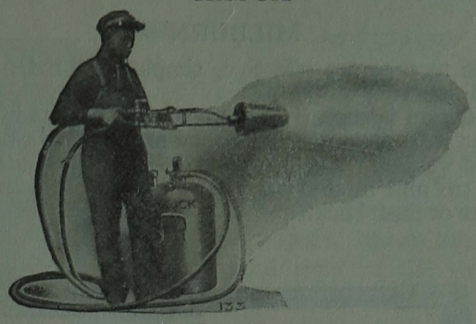


Fig. 2204

Compressed Air Type

This type is preferrable wherever compressed air is available. Flame is steady, easily regulated to proper size; burner can be operated under any pressure, varying from 10 to 120 lbs. Any grade of fuel oil, crude or kerosene oil may be burned. Will ignite without previous heating.

NOS.	Capacity of Tank, Gals.	Length of Hose, Ft.	Oil Consumption per Hour, Gals.	Air Con. Cu. Ft. free air, Per Min.	Weight Each, Lbs.
1	16	24	4	20	110
2	15	24	3	15	100
4	12	24	2	12	90
5	10	24	1	8	85
6	8	24	1	5	75

Prices on Application

HAND KEROSENE TORCHES

HAUCK

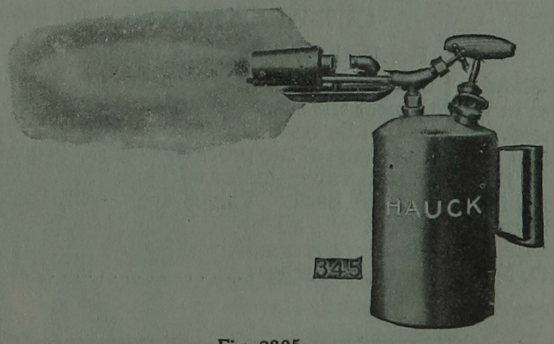


Fig. 2305

The flame of No. 14 torch will melt a piece of copper ½x¼ inch in 3 minutes; 1 inch brass rod in 2 minutes. It will heat a 2 inch shaft red hot in 5 minutes. These torches can also be used with gasolene.

The tank is made of strong material in order to withstand rough usage. All seams, bottom and fittings welded by autogeneous process. The pump placed inside the tank is of the quick acting type and only a few strokes are necessary to obtain the pressure required to operate several hours. Tank remains perfectly cool during operation, as oil regulating valve is equipped with a ball check so that no back pressure or hot oil can enter the tank. Numbers 15 and 16 are furnished with pressure gauges.

NOS.	Capacity, Gals.	Oil Consumption per Hour, Quarts	Length Flame, Inches
14	½	1	13
15	1	2	16
16	1½	3	18

Prices on Application

OXY-ACETYLENE WELDING AND CUTTING APPARATUS

MILBURN

These torches are effective, simple, well balanced and easy to operate.

The design is such that an economy of gas is effected together with maximum efficiency and speed in both cutting and welding. The perfected design of the gas passages in the tip and mixing chamber eliminates the danger of back fire or flash back.

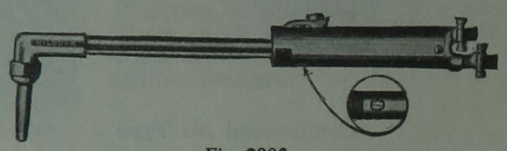


Fig. 2306

CUTTING TORCHES

The high pressure cutting oxygen is controlled by a simple thumb valve which remains fixed in either open or closed position without sustained pressure from the thumb. Has ample cutting power for any thickness of steel within the range of the process and is also very efficient on very light metal. Will operate either with oxygen and acetylene or oxygen and hydrogen.

	Each
NO. N—Length, 18 Inches	$70.00

Note:—Also made with straight head for rivet cutting, boiler tube cutting, etc.

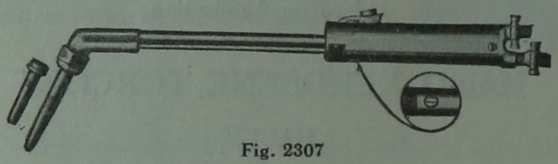


Fig. 2307

CUT-WELD TORCH

For Both Welding and Cutting

Standard torch possessing the highest cutting efficiency and in welding uses the standard welding tips. Well balanced, easy to handle and rapid; cuts any thickness of metal within the range of the process. Oxygen is controlled by a thumb button valve similar to Type "N". There is absolutely no flash back. Valves are readily accessible and easily cleaned.

	Each
NO. N-I—Length, 18 Inches	$79.00

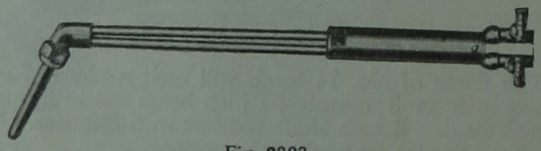


Fig. 2308

WELDING TORCH

Very easily operated welding torch; oxygen and acetylene are used at comparatively equal pressures in all kinds of work, making a softer flame and eliminating the danger of oxidation of the metal through an over-supply of oxygen. The gasses are mixed in the tip.

Construction is exceedingly simple and there is practically nothing to get out of order. A new tip will fit an old torch with absolute exactness.

	Each
NO. J-20—Repair Torch; Length, 20 Inches	$55.00
NO. J-14—Bench Torch; Length, 14 Inches	55.00
NO. LJ—Lead Burning Torch; Length, 9 Inches	15.00
NO. MJ—Manufacturers Torch; Length, 11⅝ Inches	45.00
NO. JJ—Jewelers Torch; Length, 7 Inches	15.00

BRAZING BLOW PIPES

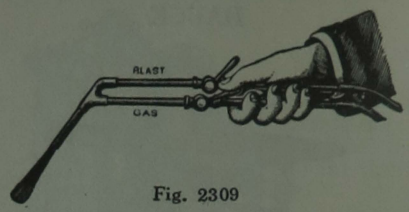


Fig. 2309

These blow pipes are used by machinists, toolmakers and repairers for annealing and for heating tools for hardening. Also used for brazing wire in automobile tires.

NOS.	8B	8B	8C
Type	Plain	Reg.	Plain
Size Air Jet, Inches	3/16	3/16	3/16
Size Gas Opening, Inches	3/8	3/8	7/16
Gas Consumption per Hour, Ft.	42	42	90
Length Over All, Inches	13½	13½	15¾
Tubing Required, Inches	5/16	5/16	3/8
Each	$1.00	1.50	1.00

NOS.	8C	8E	8F	8F
Type	Reg.	Reg.	Reg.	Long
Size Air Jet, Inches	3/16	5/16	3/8	½
Size Gas Opening, Inches	7/16	5/8	1	1
Gas Consumption per Hour, Ft.	150	150	160	160
Length Over All, Inches	15	15	15½	18
Tubing Required, Inches	3/8	9/16	5/8	11/16
Each	$1.25	2.20	2.50	3.00

Nos. 8B and 8C plain are furnished without stop-cocks, other sizes have two lever stop-cocks.

Nos. 8B, 8C and 8E are furnished for use with illuminating gas. Extra charge for fitting for natural or gasolene gas. No. 8 F Burns illuminating gas only.

BUNSEN BURNERS

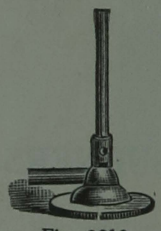


Fig. 2310

Constructed of brass and easily adjusted. Air supply is controlled by a sleeve valve. Can be used for natural or illuminating gas.

	Each
NO. 2½—Inside Diameter of Burner, 5/16 Inch; Height, 5 Inches; Gas Consumption, 3 Feet per Hour	$1.75

WHITE RUBBER TUBING

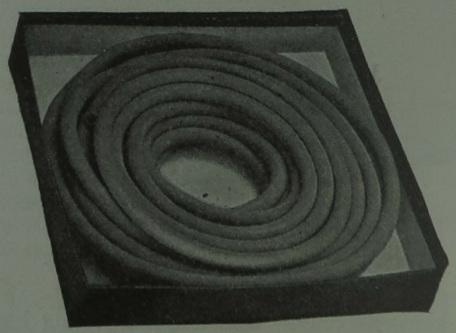


Fig. 2311

Made of pure selected rubber; smooth or corrugated. Furnished in boxes containing 50 feet.

Made from ⅛ to ¾ inch inside diameter and with walls 1/16, 3/32 or ⅛ inch thick.

Price on Application

EXTRA GRADE, PLAIN WHITE

This is a high grade, hand wrapped tubing. Furnished in 6 to 12 foot lengths.

Inside Diameter, Inches	5/16	3/8	½	5/8	1
Thickness of Wall, Inches	1/16	3/32	⅛	⅛	⅛
Per Foot	$0.14	.18	.25	.30	.45

OVEN FURNACES

STEWART

Fig. 2312

Indirect heat type, for high speed or carbon steel. Well suited for hardening tools and dies, reamers, springs, cutters, shear blades, etc. Can be supplied with oil burners. Equipped with U-shaped bottom slab, with 1½-inch projections, which protects the work from the flame and eliminates the expense of replacing muffles. Gives quick heat on small fuel consumption; fire clay lining. Has 1¼-inch gas and air connections and consumes 90 cubic feet of gas per hour.

NO.	1
Height Entrance, Inches	5
Width Entrance, Inches	9
Depth Opening, Inches	13½
Thickness Lining, Inches	4
Floor Space, Inches	28x28
Weight Each, Lbs.	950
Speed Blower, R.P.M.	600
With Blower, Each	**$155.00**
Without Blower, Each	**110.00**
Balanced Door, Each Extra	**4.00**

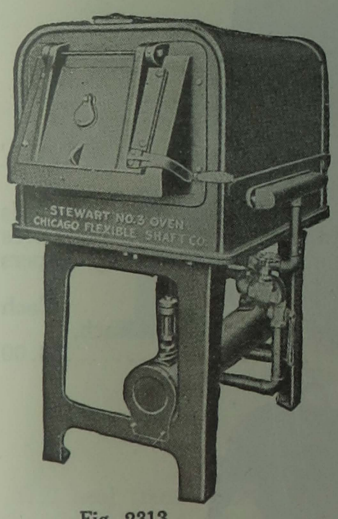


Fig. 2313

For annealing or case-hardening. Not recommended for high speed steel. Economical in consumption of fuel and will heat quickly and uniformly; the lining is heavy, thereby reducing radiation losses to a minimum. The burners, which can be furnished for either gas or oil, insure perfect combustion. Has 1½-inch gas and air connections and consumes 225 cubic feet of gas per hour.

NO.	3
Height Entrance, Inches	9
Width Entrance, Inches	15
Depth Opening, Inches	24
Thickness Lining, Inches	4
Floor Space, Inches	36x48
Weight Each, Lbs.	1750
Speed Blower, R.P.M.	600
With Blower, Each	**$255.00**
Without Blower, Each	**185.00**
Balanced Door, Each Extra	**5.00**

OVEN FURNACES

STEWART

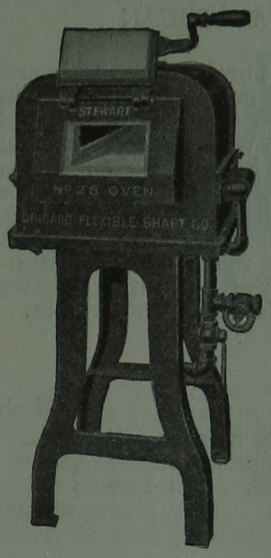


Fig. 2314

Indirect heat type, for high speed or carbon steel. Has U-shaped bottom slab which prevents the flame from touching the work. Requires but little floor space, hence can be installed right in the tool room and used for die and tool hardening. Furnished with gas burners only. Burners insure absolutely uniform mixture, producing perfect combustion without smoke, soot or odor. Has 1¼-inch gas and air connections and consumes 75 cubic feet of gas per hour.

NO.	28
Height Entrance, Inches	4
Width Entrance, Inches	8
Depth Opening, Inches	12
Thickness Lining, Inches	3
Floor Space, Inches	24x24
Weight Each, Lbs.	750
Speed Blower, R.P.M.	600
With Blower, Each	**$135.00**
Without Blower, Each	**90.00**
Balanced Door, Each Extra	**3.50**

AMERICAN

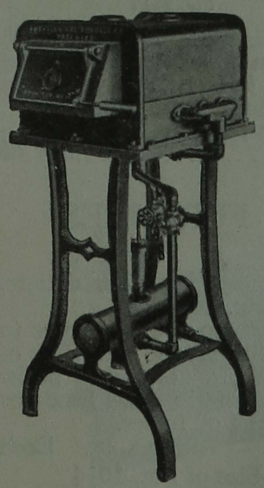


Fig. 2315

For annealing and hardening; designed to heat square or oblong material of any desired dimensions within the capacity of the furnace. Will heat uniformly throughout to any degree of temperature required for annealing or hardening metal work and high speed steel, such as cutters, dies, lathe and planer tools, etc Supplied with fire clay slab, which separates the combustion chamber beneath the slab from the heating space above it, resulting in even distribution of heat. Consumes 90 cubic feet of gas per hour.

NO.	16
Height Entrance, Inches	4
Width Entrance, Inches	8
Depth Opening, Inches	13
Floor Space, Inches	27x24
Weight Each, Lbs.	400
Each	$90.00

FORGE FURNACES

AMERICAN

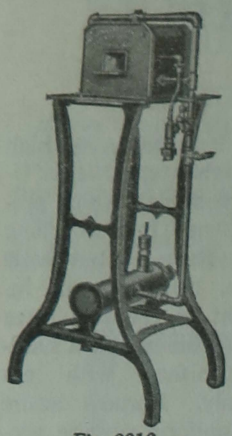


Fig. 2316

Will heat uniformly, quickly and with little or no scale. Used in machine shops for tool dressing and forging. Will develop required amount of heat in a few minutes. Made in various styles and sizes from a small bench forge, consuming 20 cubic feet of gas per hour, to a regular tool room forge for hardening large lathe tools, with a capacity of 200 cubic feet of gas per hour.

Each

NO. 1—Entrance, 3 Inches Wide, 2 Inches High, 4 Inches Deep; Gas Consumption, per Hour, 60 Cubic Feet; Floor Space, 24-20 Inches; Weight Each, 210 Lbs. $50.00

LEAD HARDENING FURNACES

Made for hardening steel in a lead bath. The burners on both sides of the body of the furnace enter the heating chamber tangent to the pot, thus securing a rotary motion of the flame around the pot without impinging on it. This insures uniform heat. Larger size furnaces with other shape of pots made to order.

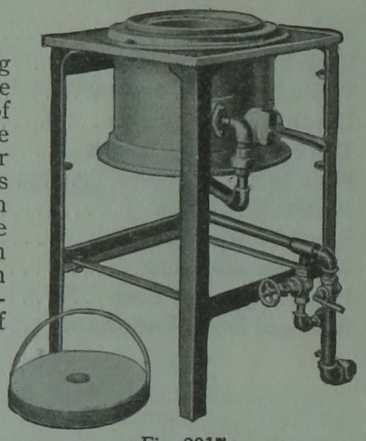


Fig. 2317

Each

NO. 43—Iron Pot, 8 Inches in Diameter, 6½ Inches Deep; Gas Connection, ½ Inch; Air Connection, ¾ Inch; Gas Consumption per Hour, 150 Cubic Feet; Floor Space, 20x20 Inches; Net Weight, 230 Lbs. $55.00

OIL TEMPERING FURNACES

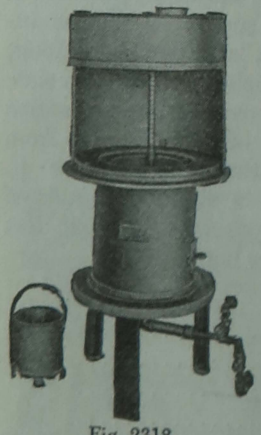


Fig. 2318

For tempering dies, cutters, knives, etc.

Burners are arranged so as to uniformly heat the pot. Bulb of thermometer extends below middle of both. Has hood for drawing off oil fumes.

Each

NO. 4—Size of Pot, 10½ Inches in Diameter, 10 Inches Deep; Basket, 7 Inch Diameter; 7 Inches Deep; Height to Top of Hood, 53 Inches; ½ Inch Gas Connection; ¾-Inch Blast Connection; Gas Consumption per Hour, 40 Cubic Ft.; Floor Space, 27x27 Inches; Net weight, 550 Lbs. $110.00

BENCH FURNACES

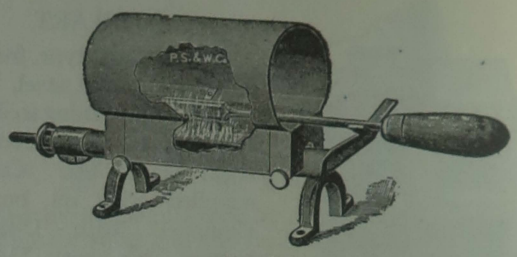


Fig. 2319

Made with cast iron base and sheet iron top. Will burn natural or artificial gas. Used for heating soldering coppers. No air blower required. Furnished with single burner, not brick lined.

Each

NO. 793—Weight Each, 8 Lbs. ..... $.....

Price on Application

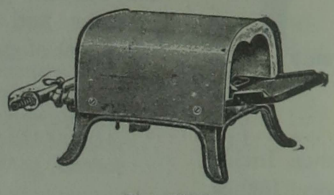


Fig. 2320

Burns natural or artificial gas; for use in heating soldering coppers. No air blower required. Has double burner, sheet iron top and is brick lined. Produces a hot blue flame.

Each

NO. 794—Weight Each, 23 Lbs. ..... $.....

Price on Application

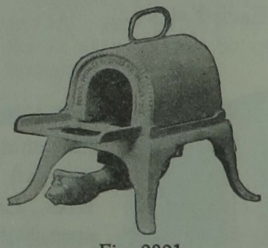


Fig. 2321

For telephone and electrical repair work. Burns all kinds of gas. Can be turned low and will not flash back. Gives a strong blue flame which strikes the soldering coppers direct. Has removable top.

Each

NO. 2—Capacity, One Soldering Iron; Weight Each, 12 Lbs. $6.00

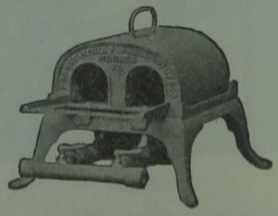


Fig. 2322

Best for general soldering purposes. Has two burners, which can be used singly. Furnished with a hood of fire brick having a center partition. Will burn all kinds of gas. Will not flash back when turned low. Has removable top. The cut shown illustrates No. 4. No. 5 is the same, with partition removed, and will accommodate 3 irons.

Each

NO. 4—Capacity, Two Soldering Irons; Weight Each, 23 Lbs. $8.00

NO. 5—Capacity, Three Soldering Irons, Weight Each, 20 Lbs. 8.00

GAS BENCH FURNACES

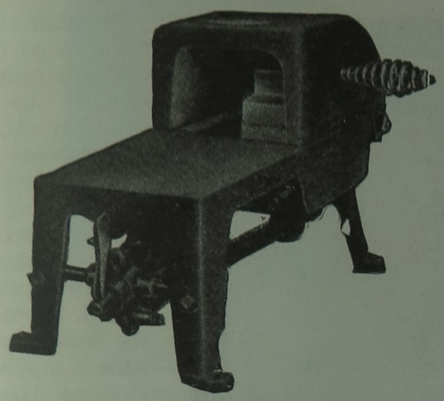


Fig. 2323

These furnaces will heat soldering irons up to 6 lbs.; heats a pair in less than 5 minutes. Maintains a temperature of 1800 to 2000 degrees F. without any forced air blast or blower. Supplied with pilot light.

Each

NO. 1—Length, 12 Inches: Fire Box Opening, 3½x2½ Inches; Gas Consumption, 10 Cubic Feet per Hour; Weight Each, 12 Lbs. $11.00

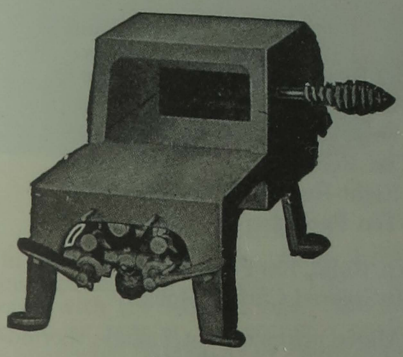


Fig. 2324

Will heat treat carbon steel tools such as dies, gears, taps, reamers and chisels and heat irons up to 10 lbs., a pair in less than five minutes; can be used for metal melting. Maintains a temperature of 1800 to 2000 degrees, F. without any forced air blast. A blower is unnecessary, which eliminates the use of a muffle. It is equipped with two atmospheric burners each having a separate pilot light and shut off valve.

Each

NO. 101—Length, 14 Inches; Fire box Opening, 3¾x 4½x5½ Inches; Height Over All, 7½ Inches; Gas Consumption per Burner, 12 Cubic Feet an Hour; Weight Each, 18 Lbs. $14.00

GAS BENCH FURNACES

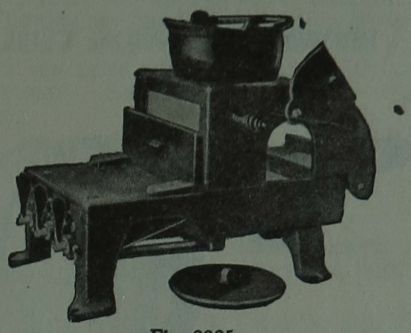


Fig. 2325

For heat treating carbon steel tools. Can also be used for heating long rods by opening side doors of the hood. Will heat the largest soldering irons, branding irons, etc. Lid may be removed and a 20-pound capacity melting pot inserted for melting small quantities of metal. Maintains a temperature of 1800 to 2000 degrees F., without any forced air blast or blower.

Each

NO. 118—Length, 16 Inches; Fire Box Opening, 6¼x 5x6½ Inches; Mouth, 4x6 Inches; Height, 9½ Inches; Gas Consumption, 40 Cubic Feet per Hour; Weight, 45 Lbs. $27.50

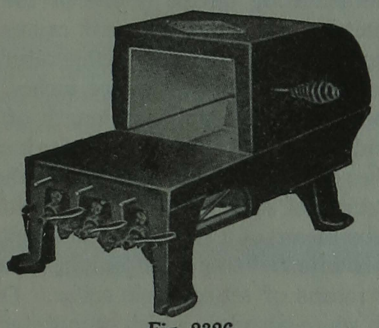


Fig. 2326

This furnace is the same as the No. 118 illustrated above, but does not have the holes inside of hood or top, and has no melting pot.

Each

NO. 108—Weight Each, 43 Lbs. $25.00

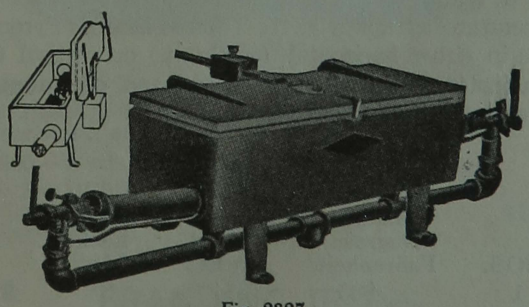


Fig. 2327

Equipped with two powerful burners. Used without power or blower for heat-treating tools or metal parts measuring 1x3x10 inches or under. Burners are placed so that the flames rotate around the work.

Each

NO. 102—Length, 28 Inches; Combustion Chamber, 4 Inches Wide, 3 Inches Deep, 12 Inches Long; Gas Consumption 25 Cubic Feet an Hour; Weight Each, 35 Lbs. $20.00

PYROMETERS

BROWN—EXPANSION TYPE

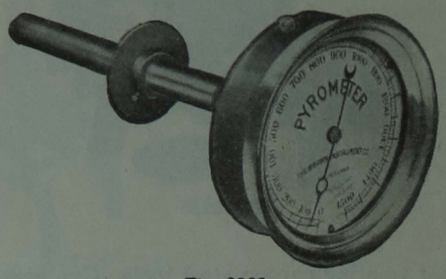


Fig. 2328

Adapted for measuring heat in flues, ovens and places where slight variations of temperature are not of vital importance. Instruments operate through the difference in expansion of graphite rods and a steel stem; ratio of expansion being clearly indicated on a dial which is graduated in terms of heat degrees Fahrenheit. A highly improved, patented compensating device is one of the features of these Pyrometers. This improvement causes the Pyrometer to indicate exactly the same temperature, no matter how much of the stem, above twelve inches, may be inserted in the heat. The standard length of the stem is 36 inches, and instruments are designed for insertion of the stem 12 inches or more in the heat, unless otherwise specified. The length of stem inserted in the heat can readily be adjusted by means of a slip collar, which fits over stem. When stem is adjusted to proper length, it can be locked in place by means of set screw in collar. Dial faces are finished with white porcelain which cannot tarnish though subjected to heat and gases. Where a rugged instrument is desired which can be placed in the hands of any one, this type of instrument will prove satisfactory. However, it is not as accurate as the Thermo-Electric Pyrometer, neither is it recommended for uses where temperatures to be measured exceed 1500 degrees Fahrenheit. Also, this type of instrument does not indicate the fluctuations of temperatures as rapidly as the Thermo-Electric Pyrometer. made in either horizontal (as shown) or vertical types. Each instrument is carefully tested and compared with accurate standards before shipment.

NOS.	Maximum Degrees Fahrenheit	Diameter of Dial Inches	Weight Each Lbs.	Each
1	800	6½	8	$16.00
2	1200	6½	8	20.00
3	1500	6½	8	21.00

For longer lengths of stems, add $1.25 per foot additional. Centigrade dials corresponding to the above ranges can be furnished instead of Fahrenheit dial without additional charge. Unless otherwise specified, vertical type Pyrometers will be furnished.

PYROMETERS

BROWN—MULTIPLE RECORDING TYPE

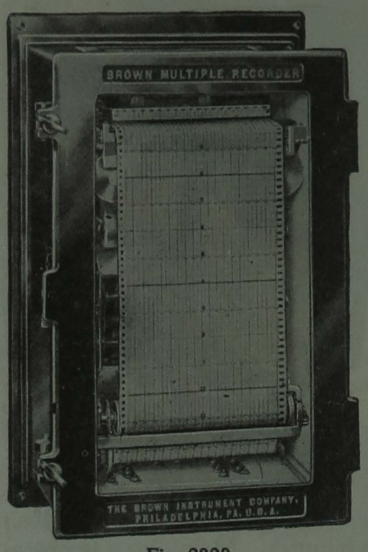


Fig. 2329

Maintains a graphic record of several thermo-couples; is supplied to produce two, four, six, eight or ten records on one chart 7 inches wide, records being recorded in different colors, thereby making it easy to distinguish each record, even though the lines may cross. A scale is supplied above indicating pointer which enables reading the existing temperature at all times. Where it is desired that record lines do not cross each other, two millovoltmeter movements are mounted in the case, side by side. These records are made in the same colors, but on different, charts; no switching device is necessary. Where four, six, eight or ten records are required, an automatic switching mechanism is necessary. Record sheet and multi-color carbon band for producing mark on chart; each lasts two months, without renewal. Resistance of instrument is over 400 ohms; measures 22 inches high, 14 inches wide and 11 inches deep. Two-record recorder is clock driven; four, six, eight or ten records are motor driven. Motors can be supplied for either 110 or 220 volts A. C. or D. C. as specified.

NOS.	Description	Maximum Degrees, Fahrenheit	Each
20	Duplex Recorder	2000–3000	$350.00
40	Four-Record	2000–3000	480.00
60	Six-Record	2000–3000	530.00
80	Eight-Record	2000–3000	560.00
100	Ten-Record	2000–3000	590.00

Extra Chart Rolls, 100 Feet Long $3.50
Extra Multi-colored Carbon Rolls 1.00

Note.—Above prices do not include thermo-couples.

SYPHON PRESSURE GAUGES

Fig. 2330

Suitable for indicating low pressures or volumes from 3 to 24 inches of water; furnished with "U" tube with either front or back connections as specified and mounted on metal back. A level is supplied to insure vertical position for the gauge. Adjustable scale permits setting it to zero for the level of the liquid without necessity of refilling frequently.

Scale, Inches	Each	Scale, Inches	Each
0–6	$10.00	0–18	$20.00
0–12	15.00	0–24	24.00

PYROMETERS

BROWN

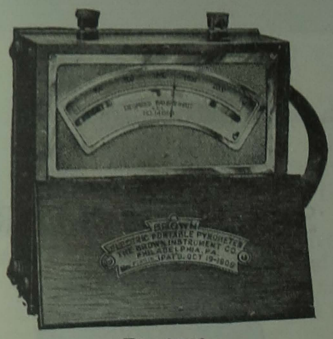


Fig. 2331

PORTABLE TYPE

For use in boiler flues and stacks, hardening furnaces, muffles, annealing and tempering furnaces, salt baths and brass, bronze and copper melting pots. Supplied in low-resistance type, approximately five ohms, for base metal thermo-couples only; or in high resistance (approximately four hundred ohms) for use with either base metal or platinum thermo-couples. Has five-inch scale with mirror under pointer for accurate reading. High resistance instruments are furnished with automatic device to lock pointer, when hinged cover is closed, preventing damage to instrument in handling or shipment. Each instrument supplied with fifteen feet double conductor wire.

	Each
Type M—Low Resistance; Weight Each, 5¾ Lbs.	$70.00
Type ML—High Resistance; Weight Each, 5¾ Lbs.	100.00

Price does not include thermo-couples.

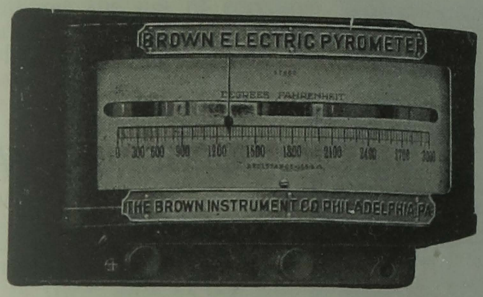


Fig. 2332

WALL TYPE

For use in blast furnaces, glass plants, brick, tile and pottery kilns; cement plants, etc. The instrument is double pivoted with jeweled bearings. Has 6-inch scale with mirror under pointer for accurate reading. High resistance is unaffected by changes in length or temperature of wire connecting thermo-couple and instrument. Base metal or platinum rhodium thermo-couples may be used. Supplied with 15 feet double-conductor wire.

	Each
Type H—High Resistance (600 ohms); Weight Each, 11 Lbs.	$100.00
Hardwood, Glass Door, Protecting Case	10.00

Price does not include thermo-couples.

THERMO COUPLES

Furnished complete with tubes, blocks or binding posts, etc.

Length, Inches	Platinum, Each	Base Metal, Each	Length, Inches	Platinum, Each	Base Metal, Each
12	$55.00	$10.00	36	$103.00	$11.75
18	65.00	10.00	39	110.00	13.50
24	75.00	10.00	50	138.00	15.25
27	82.00	11.75	60	165.00	15.25
33	96.00	11.75			

ELECTRIC SOLDERING COPPERS

May be operated on either direct or alternating current circuits. The tips are hand forged with a bevel to fit the heating heads and are interchangeable. The handle is in one piece and unscrews and slides back on the cord exposing the terminals. Each tool is furnished with six-foot cord and plug.

Fig. 2333

Equal to 1½ Lbs. per pair soldering copper. For telephone switchboards, electrical instruments, light manufacturing and small fuses.

	Each
NO. 100—Watts Consumed, 70; Total Length, 13¾ Inches; Diameter of Tip, ½ Inch; Weight Each, 12 Ounces	$7.00
Extra Tips	.40

Fig. 2334

Equal to 3 lbs. per pair soldering copper. For fast telephone work, light tinware, and automobile repairs.

	Each
NO. 200—Watts Consumed, 150; Total Length, 14⅛ Inches; Diameter of Tip, ⅞ Inch; Weight Each, 18 Ounces	$9.25
Extra Tips	.65

Fig. 2335

Equal to 4½ lbs. per pair soldering copper. For medium tinware, general manufacturing, metal patterns, automobile work and tipping in canneries.

	Each
NO. 300—Watts Consumed, 250; Total Length, 14⅜ Inches; Diameter of Tip, 1⅛ Inches; Weight Each, 29 Ounces	$11.50
Extra Tips	1.15

Fig. 2336

Equal to 6 lbs. per pair soldering copper. For heavy tinware sheet and steel work, metal boat making, refrigerator and automobile work.

	Each
NO. 400—Watts Consumed, 350; Total Length, 14¾ Inches; Diameter of Tip, 1⅜ Inches; Weight Each, 46 Ounces	$13.50
Extra Tips	1.35

Fig. 2337

Equal to 10 lbs. per pair soldering copper. For very heavy metal patterns, copper cornice work, automobile radiator work, etc.

	Each
NO. 800—Watts Consumed, 500; Total Length, 15 9/16 Inches; Diameter of Tip, 1¾ Inches; Weight Each, 65 Ounces	$18.00
Extra Tips	2.40

BRANDING IRONS

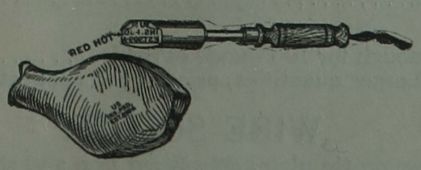


Fig. 2338

Prices will be quoted on receipt of full information concerning branding to be done and a sample of the brand.

SOLDERING COPPERS

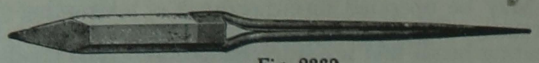


Fig. 2339

SQUARE POINTED COPPERS

Made of drawn copper bars of the best quality and shaped under a hammer. Furnished in weights as follows: 1, 1½, 2, 2½, 3, 4, 5, 6, 7, 8, 10, 12, 14 lbs. per pair.

Weight to Pair, Lbs....	3 and heavier	2½	2	1½	1
Per Lb. Over Base.....	Base	$0.01	.02	.03	.06

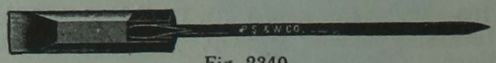


Fig. 2340

BOTTOM COPPERS

Can be furnished in weights as follows: 3, 4, 5, 6, 8, 10, 12 Lbs. per pair.

Same price as square pointed coppers.

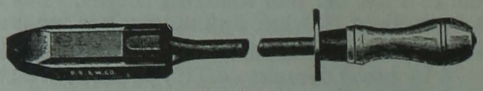


Fig. 2341

ROOFING COPPERS WITH SHIELD

Designed especially for roofers' use and is furnished with shield and handle.

Sizes, 4, 6, 8, 10, 12 Lbs. per pair.

Same price as regular soldering coppers.

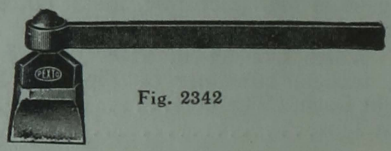


Fig. 2342

HATCHET COPPERS

Furnished with swivel handle. Can be supplied in weights as follows: 2, 3, 4, 5, 6 pounds per pair. Sold at .05½ cents per Lb. advance over price of regular square point soldering coppers.

SOLDERING COPPERS, HANDLES

Made of soft wood with wire around bottom to prevent cracking or splitting.

	Per Dozen
NO. 31	$0.60

ALUMINUM SOLDER

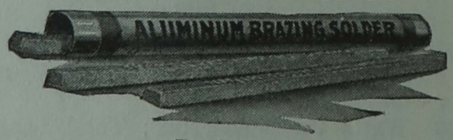


Fig. 2343

Any one can solder aluminum with this aluminum solder by following directions. A flux is not wholly necessary, but a flux is furnished which facilitates working the solder.

	Each
In Sticks	$0.25
	Per Stick
Flux, Enough for 10 Pounds of Solder	$0.20

Larger quantities, prices upon application

WIRE SOLDER

For use on tin plate, galvanized iron and sheet copper. It flows freely and is clean. Will not blacken the soldering copper.

Prices on Application

HALF AND HALF SOLDER

Fig. 2344

Supplied in bars of about 2 pounds.

Price on Application

SPELTER SOLDER

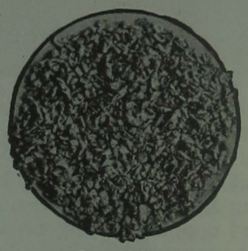


Fig. 2345

BRASS SPELTER SOLDER

No. 20—Coarse long grain.
No. 21—Medium long grain.
No. 22—Fine long grain.
No. 23—Extra fine long grain.
No. 24—Coarse long grain.
No. 25—Fine round grain.
No. 26—Extra fine round grain.
No. 41—Special fine grain.

Packed in one-pound paper boxes, and 10 and 25-pound screw-cap tin cans.

Prices on Application

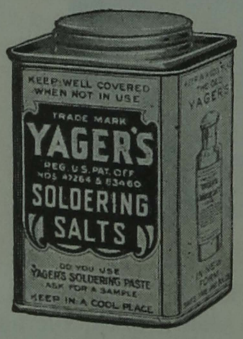


Fig. 2346

SOLDERING SALTS

Size Container, Pounds	Each
½	$0.60
1	.90
5	4.00

SOLDERING PASTE

BURNLEY

An economical non-corrosive paste, for general soldering purposes, put up in 2-ounce tin boxes.

Prices on Application

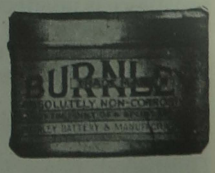


Fig. 2347

SOLDERING STICKS

ALLEN

Fig. 2348

Each	$0.30

SOLDERING PASTE

NOKORODE

Fig. 2349

Will flux all metals except aluminum. Takes the place of acid in all soldering jobs. Absolutely non-corrosive; safe as resin and rapid as acid. Not affected by heat and does not spatter. The solder will not turn dark after using and the work has highest tensile strength known.

Free from adulteration, exceptionally economical; so carefully compounded quality always the same and the smallest particle that can be picked up contains all the fluxing elements. Absolutely free from all the injurious and unpleasant qualities of acid or acid-bearing fluxes. Originally designed to meet the exacting requirements of the electrical trade, in which its use is universal. In general use by all the big automobile and automobile radiator manufacturers, can manufacturers, canning industries, and in all the varied metal ware manufacturing lines, etc.

Size of Can	Standard Package	Per Can	Per Carton
2 Oz.	36 to Carton	$0.50	$9.00
		Per Lb.	
1 Lb.	to Carton	$1.80	9.00
1 Lb.	Any Quantity	1.00	
25 Lbs.	Any Quantity	.90	
50 Lbs.	Any Quantity	.90	

SOLDERING SALTS

NOKORODE

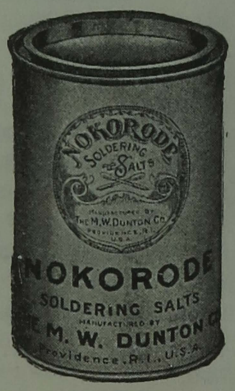


Fig. 2350

Eliminates the use of corrosive soldering acid and is the remedy for all soldering troubles. Makes perfect, lasting and non-corrosive joints wherever used. Extensively used in all metal trades by plumbers, tinsmiths, and leading manufacturers in all lines. Highly economical; four barrels of these salts, each weighing five hundred pounds, take the place of two carloads of acid. It is recommended to dissolve 1 pound of these salts in one gallon of water; 1 and 5 lb. in friction top, enameled cans.

Size of Can, Lbs.	Standard Package	Each	Per Carton
1	6 to Carton	$1.80	$9.00
5	Any Quantity	1.00	
25	Any Quantity	.90	
50	Any Quantity	.90	

Fig 2351

Barrel Lots—Nokorode Paste or Salts

Nokorode Paste or Salts is packed in 500 Lb. barrels (average).

Per Pound.....$0.80

LIQUID GLUE

LE PAGE'S

Fig. 2352

Is prepared and put up in large size cans especially for manufacturers, carpenters and mechanics. The glue possesses great adhesive qualities. The cans have outside friction tops easily removed and quickly closed. Safe and convenient for carrying in tool bag.

NOS.	31	32
Contents, Pints	½	1
Number in Case, Dozen	2	1
Weight per Case, Lbs.	21	18
Per Dozen	$6.00	10.20

NOS.	33	35	36
Contents, Gallons	2	1	5
Number in Case, Dozen	1	½	1/12
Weight per Case, Dozen	37	71	56
Per Dozen	$18.00	54.00	252.00

WELDING COMPOUND

CHERRY HEAT

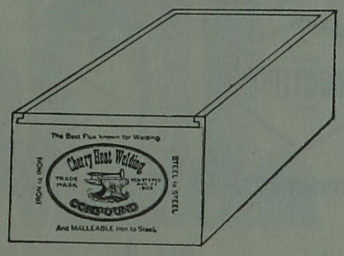


Fig. 2353

For welding iron to iron, steel to steel, and malleable iron to steel.

Container	Bbl.	½ Bbl.	Keg
Contents, Lbs.	550	350	150
Per Pound	$0.11	.11½	.11⅝

Quantity in Box, Lbs.	100	50	25
Per Pound	$0.11¾	.12	.12

Quantity in Box, Lbs.	10	5	1
Per Pound	$0.13	.13	.22

REFINED BORAX

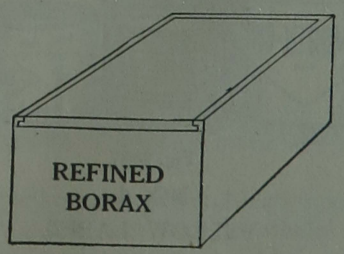


Fig. 2354

	Per Lb.
Lump Borax	$0.15
Powdered Borax	.20

IRON CEMENT
SMOOTH-ON

Fig. 2355

NOS. 1 and 2
BLUE LABEL

A chemically prepared iron compound in powder form. Prepared by mixing with water to the consistency of stiff putty.

When in this putty state, apply immediately, because the metalizing action of the cements is rapid. In a few hours becomes as hard as iron. The No. 2 acts slower than the No. 1.

Smooth-on iron cement No. 2 is semi-hydraulic, which makes it valuable for quick repairs in damp places. After this cement has set, its hardening is hastened by sprinkling with water. It may be used in a dry place by sprinkling with water two or three times after it has set.

In 1, 5, 10 and 25 Lb. Cans.

Per Pound $0.50

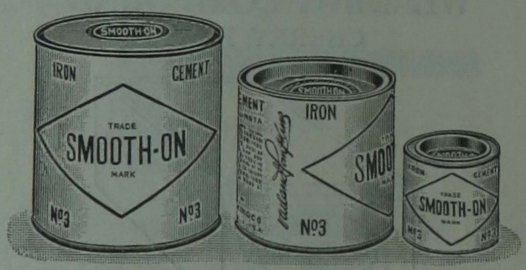


Fig. 2356

NO. 3
GRAY LABEL

An elastic iron cement, especially prepared for use on all seams of boilers or tanks to stop leaks, also for boiler patching and for screw thread joints. Applied as a paint, paste or putty. Is hardened by heat, and quick results are obtained only by applying it to warm metal, or heating the metal directly after application.

In 1, 5 and 10 Lb. Cans.

Per Pound $0.50

Fig. 2357

NO. 4
YELLOW LABEL

For repairing blemishes, blow holes or defects in iron or steel castings. Applied as a putty.

In 1, 5, 10 and 25 Lb. Cans.

Per Pound $0.50

IRON CEMENT
SMOOTH-ON

Fig. 2358

NO. 5
RED LABEL

In two strengths, regular and special. Regular for soil pipe and greenhouse pipe joints. Special for high pressure water and gas main joints.

In 1, 5, 10 and 25 Lb. Cans.

Per Pound $0.50

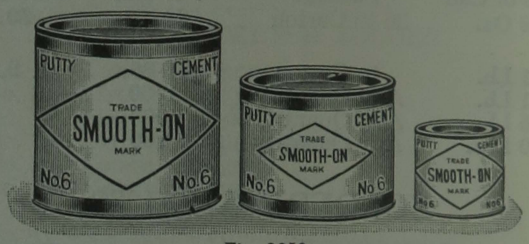


Fig. 2359

NO. 6
WHITE LABEL

A plastic putty cement for making tight joints, filling up rivet heads, butt seams and uneven or open places on structural iron or steel work and for filling seams on woodwork, for placing or resetting glass in metal skylights and for making tight joints between iron work and concrete foundations.

In 1, 5 and 10 Lb. Cans.

Per Pound $0.50

Fig. 2360

NO. 7
FOR CONCRETE

A hydraulic cement most valuable for use in connection with concrete and Portland cement mixtures. When such mixtures are applied to cracks or leaking places in concrete the expanding action of the smooth-on cement in the mixture completely fills all cracks or porous places, making them watertight.

In 5, 10 and 25 Lb. Cans.

Per Pound $0.50

BABBITT METAL

Fig. 2361

FAIRBANKS GENUINE

Made from the original genuine babbitt formula, with great care to preserve purity of its constituents. It contains no lead, spelter, scrap, or other impurities and can be relied upon to give the best results, not only for general work, but for the lining of all heavy bearings, where severe usage may be expected. While greater in first cost than other lining metals, its strength, high lubricating qualities, fluidity and freedom from dross after repeated melting cause the best engineers to pronounce it the most economical in use. It is cast in 5-pound ingots and substantially packed in 100-pound boxes.

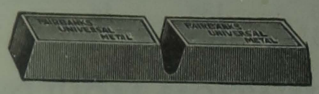


Fig. 2362

FAIRBANKS UNIVERSAL

Fairbanks Universal is the last formula made up by us. There was quite a demand for a metal not so expensive as the Fairbanks Genuine, but of a higher grade than the metals manufactured and known as anti-friction metals. The Fairbanks Universal, as the name signifies, can be used in all cases where babbitt can be used. The formula of this metal conforms more nearly to that of the metal known as the genuine babbitt than any other metal. There is a large percentage of copper, which makes it exceedingly tough. It is particularly adapted for use in connection with babbitting street car journals, elevator bearings and where there is heavy pressure. Great care is exercised in fluxing the ingredients at the proper heat so as to withstand the strain put upon it, and the metal will not flake or crush out, as do the metals composed of more lead and less copper and tin. It is cast in 5-pound ingots, and substantially packed in 100-pound boxes.

Fig. 2363

FAIRBANKS ANTI-FRICTION

After repeated tests, and the guaranty which continued use in the most difficult situations alone can give, we do not hesitate in pronouncing Fairbanks Anti-Friction for journal bearings of every description the best that can be furnished for less cost than our Universal. It not only melts as easily as the latter, but is readily cast and can be repeatedly used. In all the qualities which go to make up the best bearing metal, it is superior to any of the patent anti-friction metals which have lately been extensively advertised and sold at high prices. It is cast in convenient ingots of about 7 to 8 pounds, and strongly packed in 100-pound boxes.

Prices on All Above on Application

BABBITT METAL

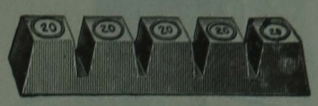


Fig. 2364

NO. 20

FAIRBANKS

No. 20 is highly appreciated by a large class of consumers who wish to secure an excellent metal at a somewhat lower price. It is recommended for almost every class of ordinary bearings in engines, flour mills and general machinery. It is cast and packed like Anti-Friction.

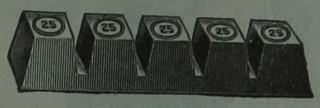


Fig. 2365

NO. 25

FAIRBANKS

A very superior metal for the price asked, and is suitable for all classes of light running machinery, small engine bearings, agricultural machinery, etc. Cast and packed like Anti-Friction.

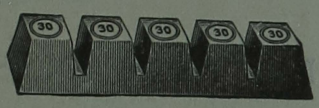


Fig. 2366

NO. 30

FAIRBANKS

No. 30 is the best low priced bearing metal on the market. Suitable for pulleys, hangers, line shafting, etc.

Fig. 2367

MAGNOLIA

A self-lubricating metal. Requires but little oil and prevents the expense of stopping machinery to cool bearings.

It will stand heavy pressures and high speeds.

Pours freely and is free from blowholes and dross. Makes a sharp, clean casting.

Ingot weighs about 5½ pounds. Packed in boxes containing 56 or 112 pounds.

Prices on All Above on Application

SOLDER POTS

Fig. 2368

NO. 398

Diameter on Top, Inches	5	6	7	8
Weight Each, Lbs.	2 7/16	4 1/2	5 1/2	9 1/4
Each	$0.30	.40	.70	.90

Diameter on Top, Inches	9	10	12	13 1/2
Weight Each, Lbs.	14	15 1/4	27 3/4	43 3/4
Each	$1.25	1.80	2.80	4.00

MELTING POTS

Fig. 2369

Made of heavy gauge pressed steel with hinged bail and two pothooks.

Diameter, Inches	7	8	9	10
Lead Capacity, Lbs.	50	75	100	125
Each	$2.25	2.55	3.15	3.75

MELTING LADLES

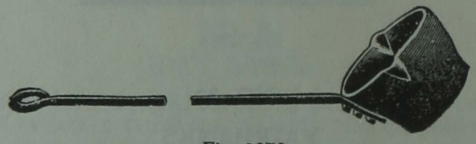


Fig. 2370

Double lip, cast iron bowl with wrought iron handle.

Diameter Bowl, Inches	Depth Bowl, Inches	Capacity Lead, Lbs.	Weight Each, Lbs.	Each
5	3 1/2	25	8 1/2	$2.00
8	4 1/4	50	16	3.00

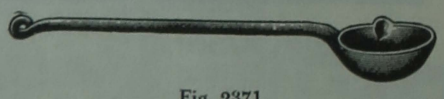


Fig. 2371

Made of wrought steel with handle welded to the bowl.

Diameter Bowl, Inches	Capacity Lead, Lbs.	Weight per Dozen, Lbs.	Per Dozen
2 1/2	1 1/8	6	$4.50
3	1 3/4	7 1/2	5.80
3 1/2	2 1/8	9	6.60
4	4 5/8	13 1/2	8.25
5	7 5/8	19	11.25
6	12 3/8	30	13.90

MELTING LADLES

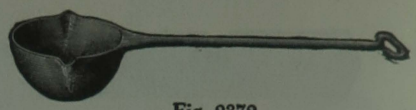


Fig. 2372

SEAMLESS STEEL

Extra strong. Made of steel plate with bowls and handles in one solid piece. Handles long and strong in proportion to size of bowl.

Diameter Bowl, Inches	Depth Bowl, Inches	Capacity Lead, Lbs.	Length Handle, Inches	Weight Each, Lbs.	Each
2 1/2	1 3/16	1	16	1/2	$0.33
3	1 1/2	2	17	1	.45
4	2	5	18	2	.60
5	2 1/2	11	26	3	.84
6	3 1/4	23	29	5	1.56
7	3 5/8	35	30	7	1.89
8	4	59	33	9	2.37
9	4 1/4	106	35	12	3.15
10	4 3/4	141	40	17	3.78
11	5 5/16	159	40	23	4.20
12	6	188	44	28	4.80
14	6 7/8	354	44	35	5.40

COMBINATION MOULDS AND LADLES

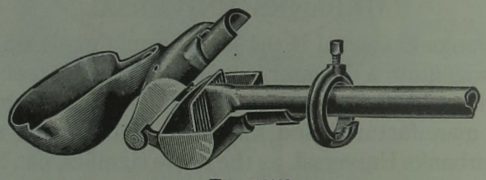


Fig. 2373

For casting soft metal hammers. By simply depressing the handle to a horizontal position, all the metal in the ladle will flow into the mould and surround the end of the handle. The handle consists of a piece of pipe forged so as to form a T-shaped end.

Mould and Ladle with One Lead Hammer		Mould and Ladle Only		Lead Hammer Only	
NOS.	Each	NOS.	Each	NOS.	Each
101	$1.25	107	$0.85	113	$0.40
102	1.50	108	.90	114	.60
103	1.80	109	1.00	115	.80
104	2.00	110	1.10	116	.90
105	2.25	111	1.20	117	1.05
106	2.50	112	1.25	118	1.25

	Per Doz.
NO. 119—Handles for 1 Lb. and 2 Lb. Hammers.	$1.80
NO. 120—Handles for 3, 4, 5, and 6 Lb. Hammers	2.00

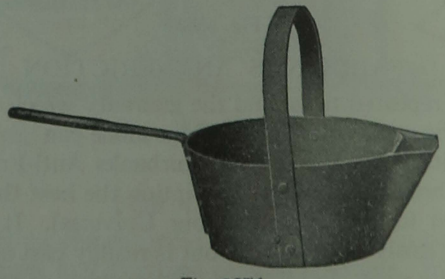


Fig. 2374

Prevents the dross and dirt from pouring out with the metal. Pressed steel; self-skimming open spout. Rigid bail, straight handle.

NOS.	Diameter, Inches	Depth, Inches	Capacity, Lbs.	Each
1175	8	5	50–75	$3.48
1175 1/2	10	5	75–100	4.86

ASBESTOS LEAD JOINT RUNNERS

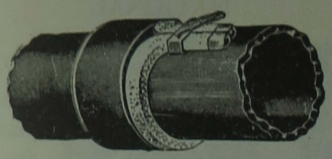


Fig. 2375

For use in pouring lead joints; saves time and insures a reliable joint; easy to apply and instantly adjusted to any pipe within its capacity. Made of asbestos fibre which is not affected by the hot lead.

NOS.	1	2	3	4
Size, Inches	¾	¾	1	1
For Pipe, Inches	2, 3, 4	4, 5, 6	6, 8, 10	10, 12, 14
Each	$2.50	3.00	4.50	6.00

PLUMBERS' DRESSERS

Fig. 2376

	Per Dozen
NO. 295—Dogwood; Weight per Dozen, 12 Lbs.	$5.50
NO. 296—Lignum Vitae; Weight per Dozen, 15 Lbs.	8.50

TURN PINS

Fig. 2377

For expanding the ends of lead pipe.

NOS.	1	2	3
Size, Inches	2¼	2½	2¾
Weight per Dozen, Lbs.	3	4½	4¾
Assorted Dogwood, per Dozen	$1.60	1.60	1.60
Assorted Lignum Vitae, per Dozen	$2.50	2.50	2.50

DRIFT PLUGS

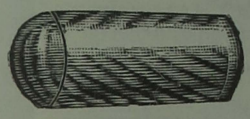


Fig. 2378

For finishing lead pipe, etc.	Per Dozen
NO. 1—Sizes, 1, 1¼, 1½, 2 Inches; Weight per Dozen, 2 Lbs.	$1.50

PLUMBERS' SCRAPERS

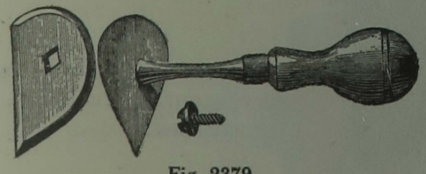


Fig. 2379

Made with removable blade, held by means of a set screw. Supplied with half-oval, oval or triangular blades.

	Per Dozen
NO. 304—Weight per Dozen, 2½ Lbs.	$2.80
Extra Blades	1.00

TAP BORERS

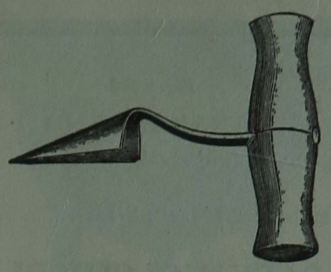


Fig. 2380

REGULAR OR N. Y. PATTERN

For tapping lead pipe.	Per Dozen
NO. 342—Light Weight per Dozen, 3 Lbs.	$2.60
Heavy Weight per Dozen, 4 Lbs.	3.50

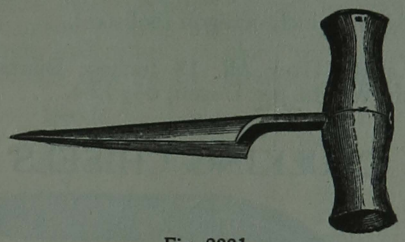


Fig. 2381

PHILADELPHIA PATTERN

For tapping lead pipe.	Per Dozen
NO. 344—Light Weight per Dozen, 3 Lbs.	$2.60
Heavy Weight per Dozen, 4 Lbs.	3.50

FORCE CUPS

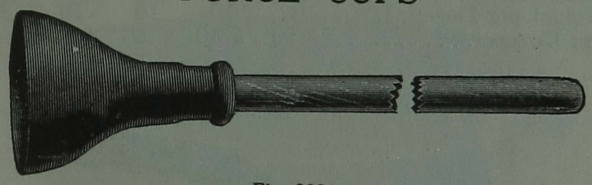


Fig. 2382

PLUMBERS' FRIEND

An apparatus for quickly removing obstructions from drain and waterpipes.	Per Dozen
NO. 400	$16.00

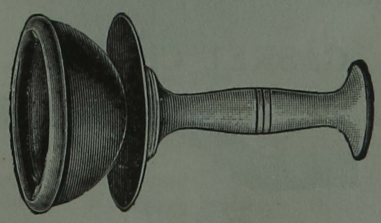


Fig. 2383

For clearing the discharge pipes of wash bowls, bath tubs, etc., when they become stopped up.

NOS.	1	2	3
Diameter Cup, Inches	3	3¾	4
Per Dozen	$6.00	9.00	12.00

PIPE BENDING SPRINGS

Fig. 2384

For bending lead pipe without kinking it.

Size, Inches	1	1¼	1½	2
Weight per Dozen, Lbs.	21½	31	41	58½
Each	$12.00	15.00	18.00	21.00

BENDING PINS

Fig. 2385

STRAIGHT END

Made of ½-inch round steel.

	Per Dozen
NO. 349—Weight per Dozen, 8 Lbs.	$3.20

PACKING CHISELS

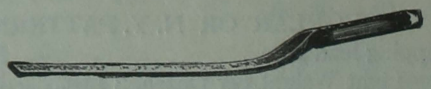


Fig. 2386

Forged from ¾-inch octagon tool steel.

	Per Dozen
NO. 10—Length Over All, 18 Inches; Diameter, ⅝ Inch; Weight per Dozen, 6½ Lbs.	$8.00

CAULKING CHISELS

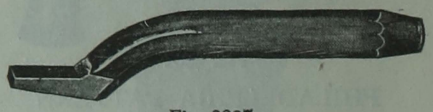


Fig. 2387

STUB END

NO. 20

Made of ¾-inch octagon steel.

Face, Inches	¼x1	5/16x1	⅜x1	7/16x1	½x1
Weight per Dozen, Lbs.	10	10	10	10	10
Per Dozen	$4.50	4.50	4.50	4.50	4.50

YARNING CHISELS

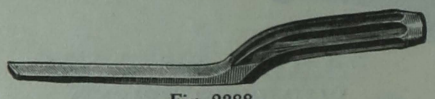


Fig. 2388

FLAT PATTERN

	Per Dozen
NO. 30—Diameter, ¾ Inch; Blades, 3-4½ Inches Long; Weight per Dozen, 10½ Lbs.	$5.20

GASKET CHISELS

Fig. 2389

Made of ¾ octagon steel with extra offset right or left.

	Per Dozen
NO. 314—Weight per Dozen, 12 Lbs.	$6.70

CORNER CHISELS

Fig. 2390

Used for caulking corners. Made of ¾-inch octagon steel.

	Per Dozen
NO. 315—Weight per Dozen, 14 Lbs.	$5.70

LEAD MELTING FURNACES

NATIONAL

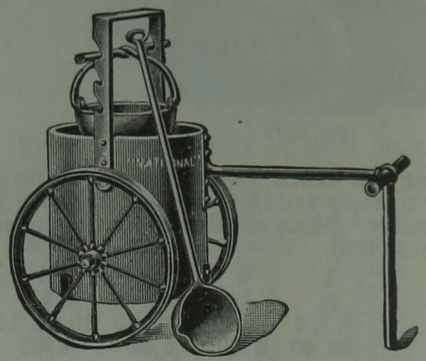


Fig. 2391

ON WHEELS

Made of boiler plate; the wheels are fitted with wrought iron rims and spokes. Furnished with heavy cast iron pot, grate, bar and heavy pressed steel ladle.

NOS.	7	8	9
Diameter, Inches	18	24	30
Nos. Pot	3	4	5
Diameter Pot, Inches	13	13½	18
Depth of Pot, Inches	7½	11	14
Capacity Pot, Lbs.	140	280	560
Each	$30.00	35.00	45.00

ON LEGS

Made of boiler plate and mounted on three strong legs. Furnished with heavy cast iron pot, grate, bar and heavy pressed steel ladle.

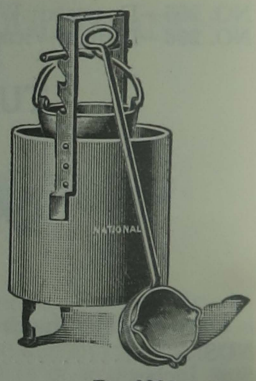


Fig. 2392

NOS.	0	1	2
Diameter, Inches	18	24	30
Nos. of Pot	3	4	5
Diameter Pot, Inches	13	13½	18
Depth Pot, Inches	7½	11	14
Capacity Pot, Inches	140	280	560
Each	$25.00	30.00	37.50

HEAVY CAST IRON GRATES

For use with the above furnaces.

Size, Inches	18	24	30
Each	$3.00	7.50	11.00

SALAMANDERS

Fig. 2393

Masons' furnaces for use in drying out new buildings. Strongly constructed.

	Each
NOS. 79—Diameter of Drum, 17x22 Inches	$10.00

TRIPOD DERRICKS

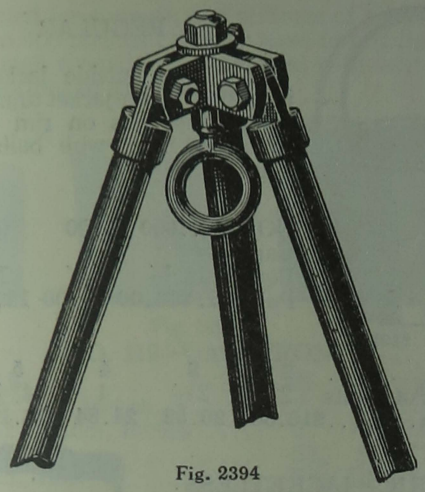


Fig. 2394

Constructed of black steam pipe and steel drop forged fittings. Ends of pipe are pointed. Can be folded up close. Suitable for hoisting ashes and general contracting work.

NOS.	Size of Pipe Diameter, Inches	Length, Feet	Weight Each, Lbs.	Safe Capacity, Tons	Each
1	1	7	38	½	$6.60
2	1	8½	45	½	7.50
3	1½	10	88	1	13.70
4	1½	12	100	1	15.00
5	2	12	145	1½	21.00
6	2	14	165	1½	23.40

BLASTING MACHINES

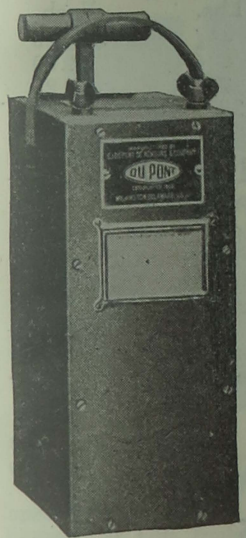


Fig. 2395

For electrically detonating dynamite charges from a safe distance without the use of powder fuses; equipped with two posts and has a capacity for 30 electric blasting caps connected with copper wire. On account of its size it is especially adapted for all general blasting and quarry and mine work where a machine of greater capacity is not required.

Each

NO. 3.—Capacity 30 electric blasting caps; Weight Each, 25 Lbs. ..... $....

Prices on Application

HICKORY MAULS

Made of best grade selected hickory with nicely turned handles. Head is fitted with iron bands.

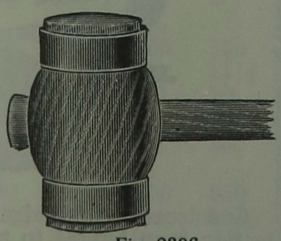


Fig. 2396

Each

NO. 0—Diameter of Head, 6 Inches; Length of Head, 12 Inches; Length of Handle, 36 Inches; Weight Each, 24 Lbs. $4.50

STEAM KETTLES

Fig. 2397

Kettles are made of very thick metal, put together with stay bolts, have ample steam space; are packed with asbestos sheet packing; tapped for inlet and drip pipes, and unless ordered for higher pressure are tested to 75 pounds hydrostatic pressure per square inch; are always perfectly safe for the pressure named.

Capacity, Gallons	Inside Diameter, Inches	Inside Depth, Inches	Weight Each, Lbs.	Each
5	14	10	255	$40.00
10	18	12	410	56.00
15	21	14	525	64.00
20	22	15	550	80.00
30	26	16	960	110.00
40	29	17	1200	130.00
60	33	20	1650	170.00
90	38	22	2095	220.00

CALDRONS

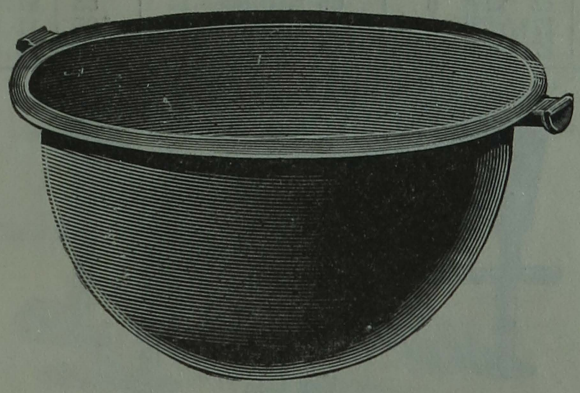


Fig. 2398

Made of the best pig iron; japanned black finish outside; guaranteed full measure and perfect.

Capacity, Gallons	Out. Dia. Flange, Inches	Ins. Diam. Flange, Inches	Depth Inside, Inches	Weight Each, Lbs.	Each
25	28	24	16	90	$12.00
33	31	28	16	110	16.00
41	34	30	19	140	20.00
48	35	31	19	150	24.00
53	36	32	20	160	26.00
58	37	33	20	165	27.00
65	39	34	20½	205	28.00
75	41	36	22	235	36.00
90	43	38	22	325	50.00
110	46	42	23	360	60.00
170	61	54	24	800	100.00
230	62½	58	31	980	140.00
500	80	72	40	2500	300.00

Sizes up to 75 gallons are cast with lugs on the rim; for larger sizes with lugs are tapped for outlet pipes, of special thickness and coated with white enamel on inside.

Prices will be Quoted on Application

GLUE HEATERS

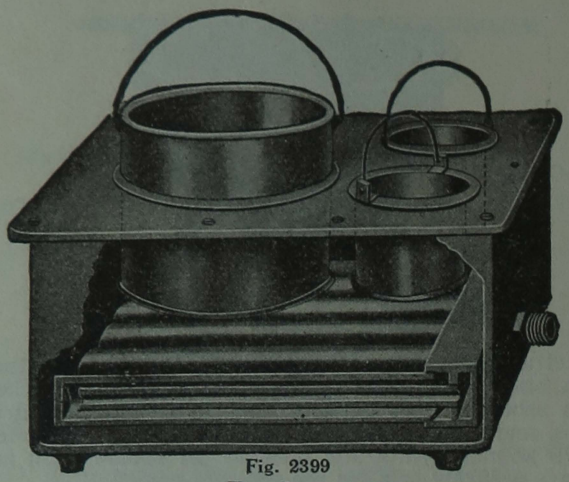


Fig. 2399

For Steam

Substantial cast iron tank, fitted with a cover with openings to carry the various combinations of pots. The heating surface is liberal and is in the form of a double radiator coil, insuring the highest obtainable heating efficiency with either live or exhaust steam.

Burners are of most approved design, with an economical consumption of fuel.

NO	Size Covers, Inches	For Steam — Without Pots			For Gas — Without Pots		
		Hgt., Inches	Wgt. Lbs.	Each	Hgt., Inches	Wgt. Lbs.	Each
1	12 x17	8	65	$10.00	14	53	$7.50
2	17¾x23	9½	115	16.00	14	105	11.50
3	17¾x30	9½	145	20.00	14	135	14.40

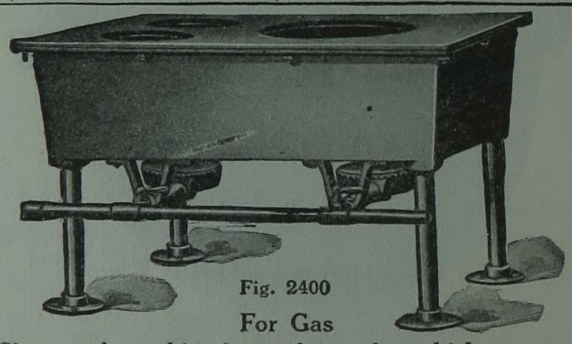


Fig. 2400

For Gas

Sizes and combinations of pots for which covers of above heaters can be supplied.

NO. 1	NO. 2	NO. 3
1–6 Inch	4– 5 Inch	8– 5 Inch
1–7 Inch	6– 5 Inch	2–12 Inch
1–8 Inch	4– 6 Inch	1–12 and 4–5 Inch
1–9 Inch	1–12 Inch	2–10 and 2–5 Inch
2–5 Inch	1–10 and 2–5 Inch	1–14 and 2–6 Inch
	1–10 and 2–6 Inch	
	1– 8 and 2–5 Inch	
	1– 8 and 2–6 Inch	

COPPER POTS FOR ABOVE HEATERS

Diameter, Inches	**5**	**6**	**7**	**8**
Depth, Inches	5	5¼	7	6¾
Capacity, Quarts	1¾	2½	4½	6
Each	**$2.00**	**2.75**	**3.75**	**4.00**
Diameter, Inches	**9**	**10**	**12**	**14**
Depth, Inches	7½	8	8	8
Capacity, Quarts	8	11	16	21
Each	**$4.50**	**4.75**	**5.50**	**1.00**

GALVANIZED POTS FOR ABOVE HEATERS — Each

Diameter 5 Inches, Depth 4⅝ Inches, Capacity 1½ quarts $0.75

GLUE POTS

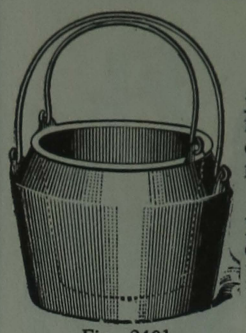


Fig. 2401

REGULAR

Cast iron outside jacket, black japanned; inside jacket tinned inside; flanged top rests on rim of water container. Iron wire bails, copper finish.

NOS.	000	00	0	1
Capacity Pot, Pints	½	¾	1	1¼
Per Doz.	**$10.00**	**11.00**	**12.00**	**13.50**

NOS.	2	3	4	5	6
Capacity Pot, Pints	2	2½	4	4½	5
Per Dozen	**$16.80**	**20.52**	**24.84**	**29.16**	**33.88**

ELECTRIC—JACKETLESS

Keeps glue at proper working temperature and consumes but one-half of the electric current required to heat a water jacket glue pot. Made of a single aluminum casting. The nature of this metal prevents the glue from sticking to the sides of the pot.

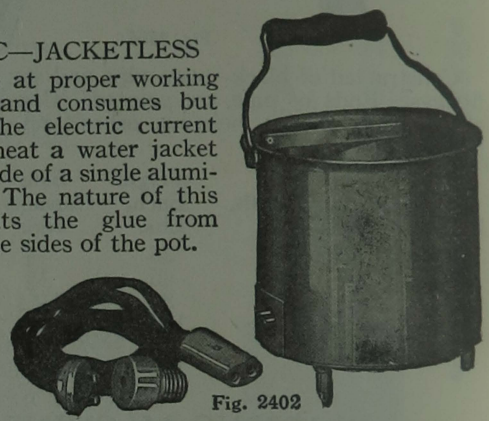


Fig. 2402

NOS.	Capacity, Pints	Watts	Weight Each, Lbs.	Each
497	2	70	4¾	$15.50
498	4	90	5½	18.00
499	8	140	7⅜	23.25
500	16	250	25	33.50

RESPIRATORS

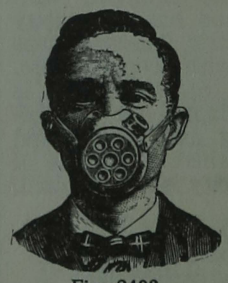


Fig. 2403

AUTOMATIC

Made of best soft white rubber, and provided with adjustable elastic bands to quickly attach to face; fine sponge and silk cloth is used as a filter. Invaluable for persons engaged in dust making pursuits or where smoke and fumes are encountered. Conforms perfectly to any face.

Per Dozen

NO. 1—Weight per Dozen, 12 Lbs. $24.00

GOGGLES

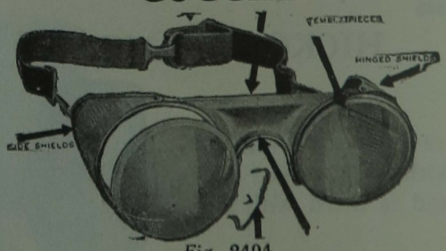


Fig. 2404

Construction of bridge and shields gives absolute protection from temple to temple. Lenses are laminated. Restital nonshatterable.

Per Dozen

NO. 1—Weight Each, 2 Ounces $18.00

One Pair in a Carton

FOUNDRY LADLE BOWLS

Constructed for strength and stiffness of best material; bowls up to 400 pounds capacity have forged lips, larger sizes have high riveted lips. Supplied with vent holes in sides and bottom to carry off gases.

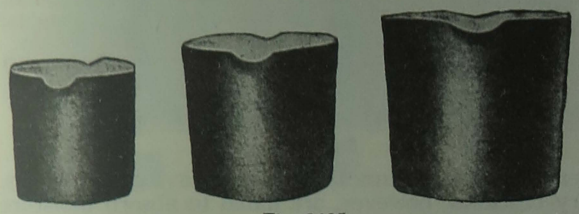


Fig. 2405

NO. 112—CAST IRON

Capacity, Lbs.	30	40	50	60
Diameter at Top, Inches	7	7½	8	8⅜
Diameter at Bottom, Inches	6	6½	7	7⅜
Depth, Inches	6¾	6¾	7⅝	8¼
Weight Each, Lbs.	8½	13	14	14
Each $				

Capacity, Lbs.	100	150	200	250
Diameter at Top, Inches	10	11¼	12	12¾
Diameter at Bottom, Inches	9	10	11	11¼
Depth, Inches	10	10½	11½	12½
Weight Each, Lbs.	25	32	42	55
Each $				

Capacity, Lbs.	300	350	400	500	600
Diameter at Top, Inches	14	14½	15½	16½	17½
Diameter at Bottom, Inches	12½	13	14	15	16
Depth, Inches	13	13½	14½	15½	17
Weight Each, Lbs.	65	70	70	90	90
Each $					

Prices on Application

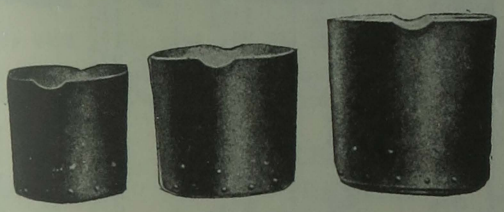


Fig. 2406

NO. 114—STEEL RIVETED

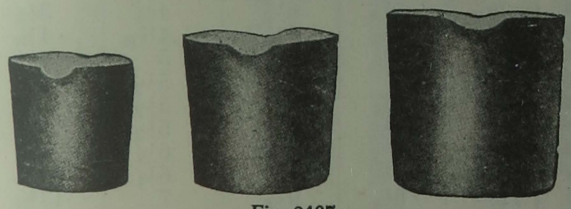


Fig. 2407

NO. 14½—STEEL WELDED

Either Riveted or Welded

Capacity, Lbs.	30	40	50	60
Diameter at Top, Inches	7	7½	8	8⅜
Diameter at Bottom, Inches	6	6½	7	7⅜
Depth, Inches	6¾	6¾	7⅝	8¼
Weight Each, Lbs.	5½	6	8	9
Each $				

Capacity, Lbs.	70	80	100	150
Diameter at Top, Inches	8¾	9¼	10	11¼
Diameter at Bottom, Inches	7¾	8	9	10
Depth, Inches	8½	9	10	10½
Weight Each, Lbs.	11	13	17	20
Each $				

Capacity, Lbs.	200	250	300	350
Diameter at Top, Inches	12	12¾	14	14½
Diameter at Bottom, Inches	11	11¼	12½	13
Depth, Inches	11½	12½	13	13½
Weight Each, Lbs.	22	26	21	35
Each $				

Prices on Application

FOUNDRY LADLE SHANKS

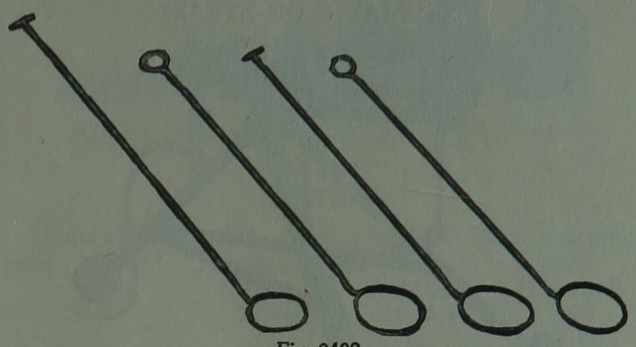


Fig. 2408

HAND LADLE SHANKS

Hollow handles for bowls, capacity up to 100 pounds. Ring handle shank furnished unless otherwise ordered. T-handle shanks made to order.

Prices on Application

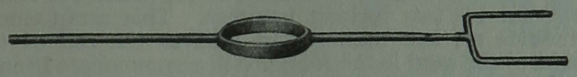


Fig. 2409

SINGLE BULL

Fig. 2410

DOUBLE BULL

Fig. 2411

DOUBLE BULL—SWIVELED

Made for bowls from 100 to 350 pounds capacity.

Prices on Application

MOULDERS' RIDDLES

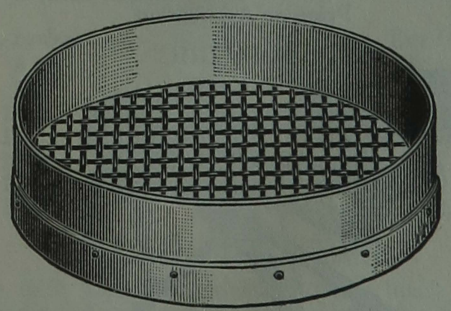


Fig. 2412

Plain reinforced hardwood frame; two heavy wire bottom braces; depth, 4¾ inches.

Diameter, Inches	Weight Per Dozen, Lbs.	Heavy Steel, Per Dozen	Heavy Galvanized, Per Dozen	Heavy Brass, Per Dozen
16	40	$ 8.00	$10.00	$16.00
18	50	10.00	12.00	18.00
20	60	12.00	15.00	20.00

Heavy steel, furnished in 2 to 24 mesh; galvanized, 2 to 20 mesh; brass, 2 to 40 mesh.

SAND SIFTERS

PNEUMATIC OR STEAM

Fig. 2413

MOUNTED ON TRIPOD

Portable and adapted to floor work in any place where a quantity of sand is to be screened at one time. The screen holder is directly connected to the piston rod and is supported by two rocking uprights. This arrangement eliminates all lost motion and relieves the rod of the weight of the sand in the riddle. Will accommodate 18-inch foundry riddle, which is securely held by means of a clamping device. Tripod is made of heavy angle iron with top and balls cast on. Will operate at any air pressure above 20 pounds. Has 2 7/16-inch bore. Weight each, 120 pounds. Can be easily arranged to operate on steam.

Price on Application

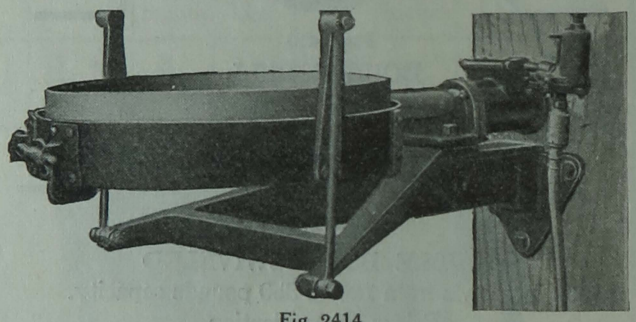


Fig. 2414

STATIONARY WALL MOUNTING

Similar to sifter described above. Frame is mounted in cast iron sockets on post or wall. Weight each, 65 pounds.

Price on Application

ELECTRIC

Fig. 2415

Of the same construction and capacity as the small tripod shaker, but is operated by 1/3 H. P. electric motor. Motor and gears are protected by housing. Weight each, 175 pounds. **Price on Application.**

CRUCIBLES

Fig. 2416

Every crucible is annealed before leaving the works. All dry crucibles, however, are liable to absorb moisture during transportation.

On arrival at your works they should be immediately unpacked and stored in a warm dry place, to dry out any moisture possibly absorbed in transit and to keep them from taking up further dampness. Then, to provide against possible accident, it is wise to re-anneal.

Before being placed in a hot furnace the temperature of a crucible should in every instance, in the re-annealing, be slowly raised to at least 212° Fahrenheit, or a little above the temperature of boiling water. This will remove all moisture.

STANDARD SIZES OF CRUCIBLES

Dimensions Revised According to Proposed Suggestions of the Committee of the American Institute of Metals

NOS.	Height Outside, Inches	Dia. at Top Outside, Inches	Dia. at Bilge Outside, Inches	Dia. at Bottom Outside, Inches	Capacity in Liquid, Pints
0	2	1 1/2	1 1/2	1 3/16	....
00	2 1/4	1 13/16	1 13/16	1 1/2	....
000	2 1/2	1 15/16	1 15/16	1 1/2	....
0000	2 15/16	2 3/8	2 3/8	1 3/4	1/4
1	3 5/8	3 1/4	3 1/8	2 1/4	1/2
1 1/2	4	3 1/2	3 3/4	2 3/8	5/8
2	4 1/2	3 3/4	3 11/16	2 7/8	3/4
3	5 1/4	4 1/4	4 1/8	3	1
4	5 5/8	4 5/8	4 9/16	3 3/16	1 1/2
5	6	4 7/8	4 7/8	3 1/2	1 3/4
6	6 1/2	5 1/4	5 1/4	3 7/8	2 1/4
7	6 3/4	5 1/2	5 1/2	4	2 1/4
8	7 1/8	5 3/4	5 7/8	4 1/4	3
9	7 5/8	5 7/8	6 1/4	4 3/4	3 1/2
10	8	6 1/8	6 9/16	4 13/16	4 1/10
12	8 1/4	6 3/4	6 3/4	5	4 1/2
14	8 5/8	7	7 1/4	5 1/2	5 3/10
16	9 1/2	7 1/4	7 3/4	5 1/2	7 3/10
18	10	7 1/2	8	5 1/2	7 7/10
20	10 3/8	7 3/4	8 1/2	6 1/4	9 3/10
25	11	8 1/4	9	6 1/4	11 1/10
30	11 1/2	8 3/4	9 3/8	7	13 2/10
35	12 1/4	9 3/8	10	7 1/4	16 1/10
40	12 3/4	9 5/8	10 1/2	7 5/8	18 8/10
45	13 1/4	10	10 7/8	7 3/4	21 1/10
50	13 1/2	10 1/4	11 1/2	8	23 3/10
60	14 1/8	10 1/2	11 1/2	8 1/2	24 1/10
70	14 7/8	10 3/4	12	8 1/2	29 2/10
80	15 1/2	11 1/2	12 1/2	8 1/2	32 6/10
90	16	11 3/4	12 3/4	9	38 3/10
100	16 1/2	12 1/4	13 1/4	9 1/2	39 3/10
125	16 3/4	12 1/2	14	10	44 1/10
150	19	13 1/2	14 7/8	10 3/8	49 6/10
175	19 3/4	14 3/8	16	11	65 1/2
200	20 3/8	15	16 3/4	11 7/8	76
225	20 7/8	15	16 1/4	12 1/2	84
250	21	15 1/2	17 1/4	11 3/4	88
275	22 1/2	15	17 1/8	12 1/2	92
300	22 1/2	16 1/4	17 5/8	12 3/4	103
400	24 1/2	17 1/2	19 1/2	14	139

Covers for any size can be supplied.

Everything appertaining to the melting of metals, including a refractory cement, can be furnished. Inquiries solicited.

Prices on Application

PATTERN LETTERS AND FIGURES

For foundry men, machinists and pattern makers; to put inscriptions of names, dates of patents, etc., on patterns for casting. Made of white metal, very smooth. May be fastened to wood patterns with a solution of gum shellac dissolved in alcohol. Prices are on white metal letters only. Can also be furnished in brass.

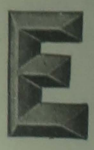


Fig. 2417
Hair Line Gothic

Fig. 2418
Sharp Face Gothic

Fig. 2419
Flattened Face Gothic

Fig. 2420
Flattened Face Gothic

Fig. 2421
Round Face Gothic

Fig. 2422
No. 3 Flat Face Gothic

Fig. 2423
Antique Pointed

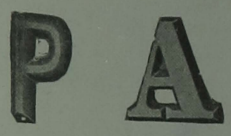


Fig. 2424
Oval Face Doric

Fig. 2425
Roman Style

Fig. 2426
Condensed Roman

ALL STYLES

Size, Inches	Each	Size, Inches	Each
3/32	$0.03	3/4	$0.05
1/8	.03	7/8	.06
3/16	.03	1	.07
1/4	.03	1 1/4	.10
5/16	.03	1 1/2	.15
3/8	.03	1 3/4	.20
7/16	.03	2	.30
1/2	.03	2 1/2	.40
9/16	.04	3	.50
5/8	.04	4	.60

Fig. 2427
Roman Gothic Branding Extra Deep

Fig. 2428
Extra Condensed Gothic Branding

Fig. 2429
Reversed Gothic Branding

BRANDING LETTERS AND FIGURES

Size, Inches	Each	Size, Inches	Each
1/4	$0.04	1	$0.11
3/8	.06	1 1/4	.12
1/2	.08	1 1/2	.15
5/8	.09	2	.30
3/4	.10	.....	.....

Price on Lower Case, Monograms and Brass Letters on Application

FILLETS

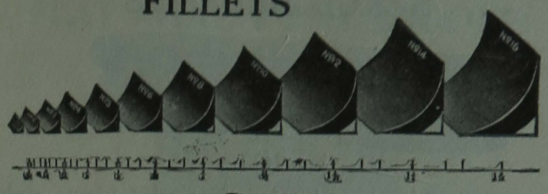


Fig. 2430

LEATHER

Made of finest grade tanned leather. Does not grow hard.

NOS.	Size Radius, Inches	Width Flat Face Inches	Per Hundred Feet
1	1/16	3/32	$2.00
2	1/8	3/16	2.00
3	3/16	5/16	3.00
4	1/4	3/8	4.00
5	5/16	1/2	5.00
6	3/8	9/16	6.00
7	7/16	3/4	7.00
8	1/2	31/32	8.00
10	5/8	1 1/16	10.00
12	3/4	1 5/32	12.00
14	7/8	1 3/8	14.00
16	1	1 9/16	16.00

WOOD

Made of best clear white pine, kiln dried and free from knots, sap and blemishes. Perfectly curved; feather edges.

NOS.	Size, Inches	Per Thousand Feet
4	1/4	$2.00
6	3/8	2.50
8	1/2	3.00
10	5/8	3.50
12	3/4	4.00
14	7/8	4.50
16	1	5.00

MOULDERS' BELLOWS

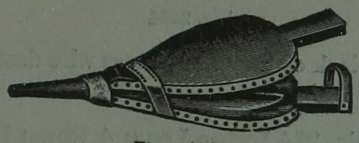


Fig. 2431

Hardwood outside boards; japanned sheet steel cap and funnel; five leaf pattern, with cowhide split leather sides or folds; trimmed with 5/8-inch wood mouldings, secured with chemically coated nails; steel side pivots and rear hook.

Size, Inches	Weight per Dozen, Lbs.	Per Dozen
8	30	$16.00
9	35	18.00
10	40	20.00
11	45	22.00
12	50	26.00
14	60	32.00
16	70	36.00

HAND BELLOWS

Single fold; hardwood outside boards, black grained; with handle extensions and leather loop for fastening; galvanized sheet steel cap and funnel; sheepskin sides or folds; faced with sheepskin leather strips and studded with tacks; hole in bottom, 1 3/4 inches, with leather valve flap.

Size, Inches	Weight per Dozen, Lbs.	Per Dozen
6	15	$12.00
7	18	14.00
8	20	16.00
9	25	18.00
10	20	20.00
11	35	22.00
12	40	26.00

SCRUB BRUSHES

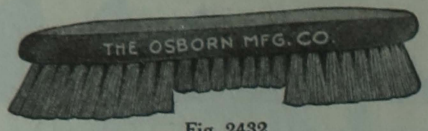


Fig. 2432

Five rows white tampico bristles; solid block, pointed ends.

Per Dozen

NO. 604—Block, 10½ Inches Long; Weight per Dozen, 7½ Lbs. $3.25

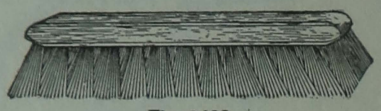


Fig. 2433

Five rows, white tampico bristles; solid block, square ends.

Per Dozen

NO. 652—Block, 2⅝x8¼ Inches; Fibre, 1 Inch Long; Weight per Dozen, 8 Lbs. $2.52

JACK

Similar to No. 652, but with palmetto fibre bristles.

NO. 652JK—Block, 2⅝x8¼ Inches; Weight per Dozen, 8½ Lbs. $3.36

MOULDERS' BRUSHES

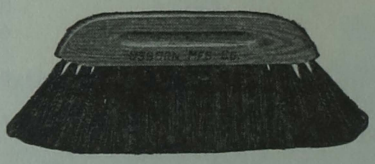


Fig. 2434

Soft pure black or grey hair; brass wire drawn; polished handle.

Per Dozen

NO. 250—Hair, 2⅞ Inches Long; 4 Rows; Block, 9x1⅛ Inches; Weight per Dozen, 7¼ Lbs. $9.60

Fig. 2435

Pure black hair; polished handle; square ends.

Per Dozen

NO. 205S—Hair, 3¼ Inches Long; 5 Rows; Block, 8⅜x2⅜6 Inches; Weight per Dozen, 7½ Lbs. $8.64

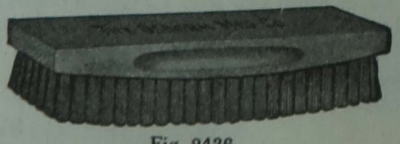


Fig. 2436

Grey or black horsehair; 6 rows.

Per Dozen

NO. 204—Length of Hair, 1⅛ Inches; Block, 8½x2½ Inches; Weight per Dozen, 8½ Lbs. $9.60

STEEL WIRE CASTING BRUSHES

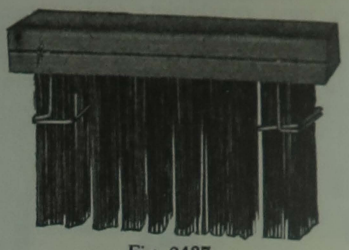


Fig. 2437

BRIDLED

Equipped with coppered steel wire bridles, attached to the two rows of wire at each end; bridles minimize the vibration and prevent breakage of wires; solid blocks; flat tempered steel wire, .017x.059 inches; 6 wires doubled per hole.

NOS.	23	27
Rows	4x10	5x10
Length Wire, Inches	4	4
Block, Inches	7½x2⅜	7½x2⅝
Weight per Dozen, Lbs.	13½	16½
Per Dozen	$6.24	7.32

Fig. 2438

First quality, flat tempered steel wire, .017x.059 inches; 5 wires doubled per hole; solid hardwood finished blocks.

NOS.	3	5½	6	7
Rows	4x10	5x10	5x10	5x10
Length Wire, Inches	4	2½	3	4
Block, Inches	7¾x2¼	7¾x2⅝	7¾x2⅝	7¾x2/5
Weight per Dozen, Lbs.	12	15¾	13½	15
Per Dozen	$4.32	4.44	4.80	5.40

STRAIGHT BACK SCRATCH BRUSHES

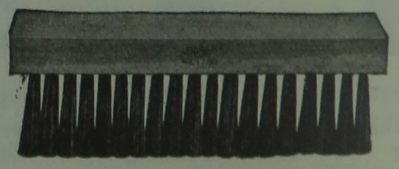


Fig. 2439

Straight back, solid block; steel wire.

Per Dozen

NO. 1780—Block, 7¼x2¼ Inches; 6x19 Rows; Length of Wire, 1¾ Inches; Weight per Dozen, 8 Lbs. $5.76

NO. 1782—Block, 7x1⅞ Inches; 6x18 Rows; Length Wire, 1⅞ Inches; Weight per Dozen, 6½ Lbs. .. 5.00

NO. 1770—Block, 6x2½ Inches; 5x15 Rows; Length Wire, 2 Inches; Weight per Dozen, 7 Lbs. 6.80

STEEL WIRE CLEANING BRUSHES

Fig. 2440

Fine round steel wire; curved back; narrow blocks; especially suited for getting into narrow inaccessible places.

Per Doz.

NO. 1777—3 Rows; Length of Wire, 1⅛ Inches; Block, 15/16 Inch Wide; Length of Brush, 6 Inches; Length Over All, 14 Inches; Weight per Dozen, 5 Lbs. $4.02

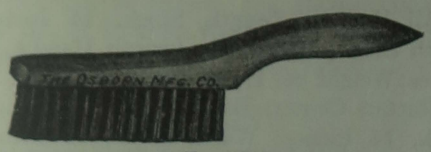


Fig. 2441

Round steel wire; shoe handle; solid blocks; particularly used for removing grease, etc., from around engines.

Per Doz.

NO. 1781—4 Rows; Length of Wire, 1 Inch; Block, 1 Inch Wide; Length of Brush, 5¼ Inches; Length Over All, 10 Inches; Weight per Dozen, 6½ Lbs. $4.68

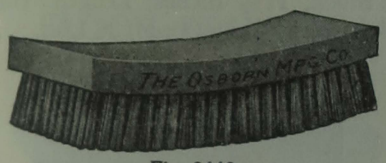


Fig. 2442

Curved back; solid block; useful in removing rust, paint and varnish.

Per Doz.

NO. 1779—9x21 Rows; Length of Wire, 1¼ Inches; Block, 7x3 Inches; Weight per Dozen, 9 Lbs. .. $7.92

ROUND STEEL WIRE PUSH BROOMS

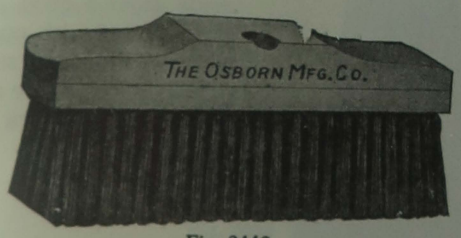


Fig. 2443

Tempered round steel wire for scrubbing cement floors, etc.

NOS.	141	142
Size Block, Inches	12x2½	14x2½
Length Wire, Inches	3½	3½
Rows	8	8
Weight per Dozen, Lbs.	25	32½
Per Dozen	$21.00	27.00

FLAT WIRE PUSH BROOMS

Fig. 2444

Tempered flat steel wire; securely held in two piece blocks.

NOS.	120	121
Size Block, Inches	12x2⅜	14x2⅜
Rows	4	4
Length Wire, Inches	5	5
Weight per Dozen, Lbs.	28½	34½
Per Dozen	$7.20	8.40

AFRICAN BASS PUSH BROOMS

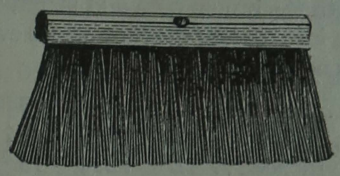


Fig. 2445

Genuine African bass; solid blocks.

NOS.	291	292	297
Block, Inches	14x3½	16x3½	16x4
Rows	5	5	6
Length Fibre, Inches	7	7	7
Weight per Dozen, Lbs.	45	45	50
Per Dozen	$17.04	19.20	21.36

NOS.	0291	0292	0297
Block, Inches	14x3½	16x3½	16x4
Bows	5	5	6
Length Fibre, Inches	5¼	5¼	5¼
Weight per Dozen, Lbs.	35	40	55
Per Dozen	$14.88	16.32	17.76

RATTAN PUSH BROOMS

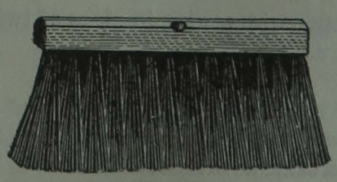


Fig. 2446

Selected round rattan; solid blocks.

NOS.	277	282
Block, Inches	16x3½	16x4
Rows	5	6
Length Fibre, Inches	6	6
Weight per Dozen, Lbs.	40	45
Per Dozen	15.00	16.80

MILL BROOMS

Fig. 2447

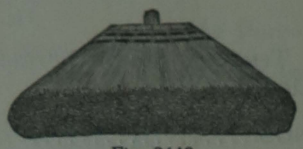


Fig. 2448

BAMBOO FIBRE MIXED

Especially used for heavy sweeping such as is encountered in sawmills, railroads or factories. Bamboo fibre is mixed thoroughly with the broom corn and is flat, which enables it to get down into cracks; the fibre wears evenly with the corn and does not scatter sweepings.

NOS.	8	9	99	10	100
Length Stock, Inches	16	16½	16½	17	17½
Width Stock, Inches	11	12½	13	14	15
Length Handle, Inches	37	37	37	37	37
Weight per Dozen, Lbs.	30	34	36	39	44
Per Dozen	**$9.58**	**10.41**	**11.25**	**12.08**	**13.75**

RATTAN MIXED

Adapted for factories, steel and iron mills, foundries, railroad warehouses, or for any sweeping of rough nature; made in wide metal case from the best broom corn with a mixture of soft round rattan reed; seasoned hardwood handle, nailed from each side with wrought iron nails, six of them going through the handle; two seams of special wax linen and an additional metal band.

NOS.	3	4	44	5	7
Length Stock, Inches	16	16½	16½	17	17½
Width Stock, Inches	11	12½	13	14	15
Length Handle, Inches	37	37	37	37	37
Weight per Dozen, Lbs.	30	34	36	39	44
Per Dozen	**$10.16**	**11.41**	**11.83**	**12.66**	**14.25**

Note.—Copper wire sewing in place of twine, 25 cents per dozen extra.

ALL CORN

Constructed same as rattan mixed broom, but the rattan is left out.

NOS.	12	14	144	16	18
Length Stock, Inches	16	16½	16½	17	17½
Width Stock, Inches	11	12½	13	14	15
Length Handle, Inches	37	37	37	37	37
Weight per Dozen, Lbs.	30	34	36	39	44
Per Dozen	**$9.58**	**10.83**	**11.25**	**11.66**	**13.25**

All Above, One Dozen in a Bundle

SNOW AND SWITCH BROOMS

RATTAN

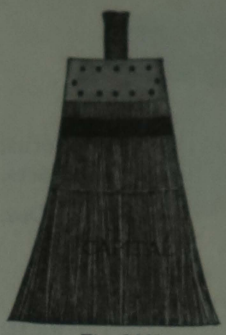


Fig. 2449

Particularly adapted for snow, switch and track sweeping; made from imported round rattan in a strong metal case, with an extra band and two seams of waxed twine sewing; hardwood handles. Absolutely waterproof.

	Per Dozen
NO. 1—All Rattan; Length Stock, 14 Inches; Width Stock, 10 Inches; Length Handle, 37 Inches; Weight per Dozen, 30 Lbs.	$8.33
NO. 2—Rattan Center, Bamboo outside; Length Stock, 14 Inches; Width Stock, 10 Inches; Length Handle, 37 Inches; Weight per Dozen 30 Lbs.	7.91
NO. 11—Prime Rattan; Length Stock, 14 Inches; Width Stock, 10 Inches; Length Handle, 37 Inches; Weight per Dozen, 30 Lbs.	10.00
NO. 20—Track Bamboo; Length Stock, 14 Inches; Width Stock, 10 Inches; Length Handle, 37 Inches; Weight per Dozen, 30 Lbs.	6.66
NO. 216—Bamboo; Length Stock, 16 Inches; Width Stock, 11½ Inches; Length Handle, 37 Inches; Weight per Dozen, 36 Lbs.	7.91

CHISEL HANDLES

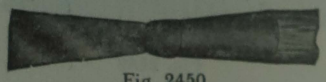


Fig. 2450

Any of the above brooms furnished with long chisel handles.

Per Dozen, Extra, ... **$2.50**

WAREHOUSE OR STABLE BROOMS

Fig. 2451

Used around warehouses, stables, and railroad shops; made from a good grade of corn; bound with one strong wire and three wax seams.

Nos. 6 and 6B are all corn; Nos. 6C and 6D are bamboo mixed.

NOS.	6	6B	6C	6D
Length Stock, Inches	18	18	18	18
Width Stock, Inches	14	16	14	16
Length Handle, Inches	38	38	38	38
Weight per Dozen, Lbs.	36	42	36	42
Per Dozen	**$12.91**	**15.00**	**13.08**	**15.00**

All Above, One Dozen in a Bundle

COUNTER OR BENCH DUSTERS

Fig. 2452

WIRE MIXED

Combination of specially prepared black hair and fine carbon steel wire, thoroughly intermingled throughout the brush, greatly increasing its stiffness; oval face; solid red stained handle; staple set.

	Per Dozen
NO. 665—Length of Bristle, 2¾ Inches; Length Over All, 8 Inches; Weight 8⅛ per Dozen, 6 Lbs.	$14.40

PLAIN

Without wire; black hair; extra full; brass wire drawn; handle, red stained finish and varnished.

	Per Dozen
NO. 9—9 Inch Block; 5½ Inch Handle; 2¾ Inch Trim; Weight per Dozen, 6 Lbs.	$12.00

FLOOR BRUSHES

Fig. 2453

WIRE MIXED

Tempered fine carbon steel wire, intermingled with grey fibre, which adds life to the brush and produces a brushing resistance on the face that is not obtainable in a bristle brush; solid green varnished blocks; two threaded handle holes; polished handle; staple set.

NOS.	896	897
Length Stock, Inches	3	3
Length Over All, Inches	14	16
Weight per Dozen, Lbs.	22	25
Per Dozen	$23.40	25.20

Fig. 2454

Mixed grey Russia bristle, medium heavy; solid red stained polished blocks; two threaded handle holes; oval face.

NOS.	664	666
Length Stock, Inches	3¾	3¾
Length Over All, Inches	14	16
Weight per Dozen, Lbs.	22	25
Per Dozen	$48.00	52.80

FLOOR BRUSHES

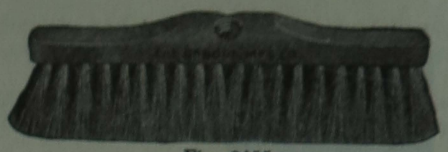


Fig. 2455

Mixed hair body, black horse hair casing; light natural varnished blocks, lower part finished in black walnut; two threaded handle holes; polished handles; staple set; oval face.

NOS.	531	532
Length Stock, Inches	2¾	2¾
Length Over All, Inches	14	16
Weight per Dozen, Lbs.	22	32½
Per Dozen	$31.80	34.80

SANITARY OR CLOSET BRUSHES

Fig. 2456

Brush part, 3½ inches diameter, 6½ inches long; length over all, 30 inches.

	Per Dozen
NO. 407—Pure Grey Hair; Straight Handle; Weight per Dozen, 6 Lbs.	$7.20
NO. 408—Pure Grey Hair; curved Handle; Weight per Dozen, 6 Lbs.	7.92
NO. 30—Pure Black Bristle; Straight Handle; Weight per Dozen, 5 Lbs.	9.00
NO. 31—Pure Black Bristle; Curved Handle; Weight per Dozen, 5 Lbs.	10.08

ROUND WINDOW BRUSHES

Fig. 2457

Solid red stained, polished blocks; two handle holes; staple set; flat face.

	Per Dozen
NO. 37—All Black Hair, 2¼ Inches Long; Diameter of Block, 4½ Inches; Weight per Dozen, 12 Lbs.	$15.00
NO. 38—All Black Hair, 2¼ Inches Long; Diameter Block, 4¾ Inches; Weight per Dozen, 15 Lbs.	18.00

WINDOW BRUSH HANDLES

Dry selected soft wood, smoothly finished.

Length, Feet	6	8	10	12
Diameter, Inches	⅞	⅞	⅞	1⅛
Per Dozen	$2.40	3.36	3.96	6.60

WALL PAINT BRUSHES

Fig. 2458

NO. 482

Black china bristles, nickel plated band; stained handle.

Width, Inches	2½	3	3½	4	4½
Length Bristles, Inches	2¼	2½	2¾	3	3
Weight per Dozen, Lbs.	3	3¾	4¼	6	6¼
Per Dozen	$6.00	7.50	9.12	13.20	15.12

VARNISH BRUSHES

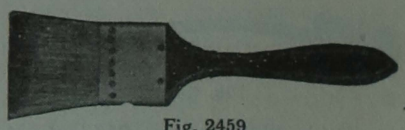


Fig. 2459

NO. 550—DOUBLE THICK

Chiselled flat, black, china bristles; tin ferrules; yellow stained handle.

Width, Inches	1	1½	2	2½	3
Length Bristles, Inches	1¾	1⅞	2	2	2⅛
Weight per Dozen, Lbs.	1	1½	2	2¼	2¾
Per Dozen	$2.00	2.55	3.40	4.25	5.75

NO. 551—DOUBLE THICK

Chiselled flat white French bristles; tin ferrules; cedar handles.

Width, Inches	1	1½	2	2½	3
Length Bristles, Inches	1⅝	1¾	2	2⅛	2¼
Weight per Dozen, Lbs.	1	1½	2	2¼	2¾
Per Dozen	$2.20	3.35	4.75	6.60	10.30

PAINT BRUSHES

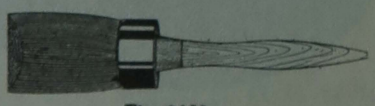


Fig. 2460

NO. 440

Oval chiselled black selected china bristles, vulcanized in rubber cement; nickel plated seamless ferrule; beaver tail handle.

NOS.	1/0	2/0	3/0	4/0
Diameter	1½	1⅝	1 11/16	1¾
Length Bristle, Inches	2½	2½	2½	2¾
Weight per Dozen, Lbs.	2¾	3¼	3½	4
Per Dozen	$9.24	10.40	11.58	12.36

NOS.	5/0	6/0	7/0	8/0
Diameter	1 13/16	1⅞	2	2 1/16
Length Bristle, Inches	3	3¼	3½	3¾
Weight per Dozen, Lbs.	4¼	4½	5	5½
Per Dozen	$15.30	18.00	21.60	28.20

WHITEWASH BRUSHES

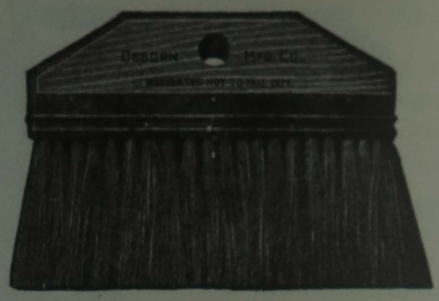


Fig. 2461

NO. 634

Selected all white bristles; brass band; block drilled at top and sides for handles.

Width, Inches	6	7	8	9
Length Bristle, Inches	2½	2¾	2⅞	3⅛
Weight per Dozen, Lbs.	7½	8	9½	10¾
Per Dozen	$18.00	24.00	30.00	36.00

GLUE BRUSHES

Fig. 2462

NO. 722—BRIDLED

Black china bristles; red steel ferrules; red stained handle with wire bridle.

NOS.	6	8	10	12
Diameter	½	⅝	¾	⅞
Length Bristle, Inches	1⅛	1¼	1⅜	1½
Weight per Dozen, Lbs.	1	1¼	1½	2
Per Dozen	$4.50	4.86	5.52	6.48

NOS.	14	16	18	20
Diameter	1	1⅛	1¼	1⅜
Length Bristle, Inches	2	2⅛	2¼	2⅜
Weight per Dozen, Lbs.	3¼	3¾	4	4¼
Per Dozen	$9.00	10.20	12.60	14.40

OIL BRUSHES

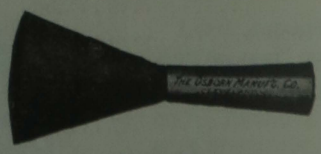


Fig. 2463

WITH TIN FERRULE

Constructed so that a wooden handle any length may be inserted in the tin ferrule.

NOS.	1	2	3
Diameter, Inches	½	⅝	¾
Length Stock, Inches	2	2	2
Weight per Dozen, Lbs.	⅜	½	⅝
Per Dozen	$1.80	2.10	2.40

NOS.	5	6	7
Diameter, Inches	½	⅝	¾
Length Stock, Inches	2¼	2¼	2¼
Weight per Dozen, Lbs.	¾	⅞	1
Per Dozen	$2.40	3.00	3.50

Note.—Nos. 1, 2 and 3 are American bristle; Nos. 5, 6 and 7 are black hair.

DERRICK FITTINGS

Below are illustrated the various fittings used in making up the derricks and cranes listed on the following pages. While these outfits can be supplied complete, it will often be found more economical to purchase the fittings and do the framing on the ground.

We are in a position to meet the requirements of shipyards, storage yards, lumber yards, mills, stone quarries, contractors, etc., and will be pleased to give complete data for any application to handle loads from 500 pounds up to 50 tons, using masts from 4 inches to 30 inches.

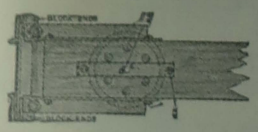


Fig. 2464
Boom End No. 1

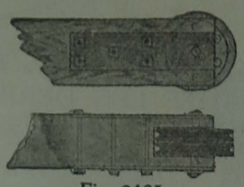


Fig. 2465
Boom Heel No. 2

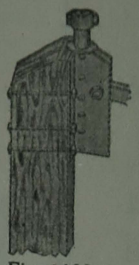


Fig. 2466
Mast Head No. 3

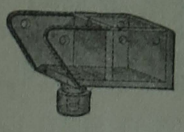


Fig. 2467
Foot Block No. 4

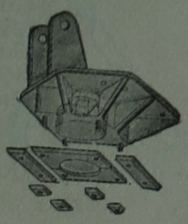


Fig. 2468
Foot Block Step No. 5

Fig. 2469
Single Block No. 6

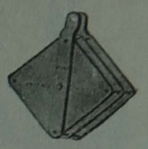


Fig. 2470
Double Block No. 7

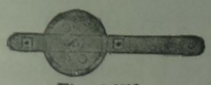


Fig. 2471
Single Sheave Strap No. 8

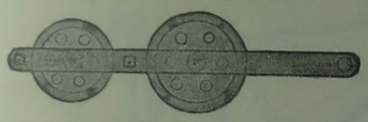


Fig. 2472
Double Sheave Strap No. 9

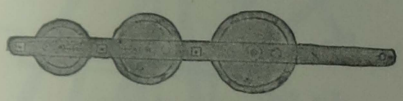


Fig. 2473
Triple Sheave Strap No. 10

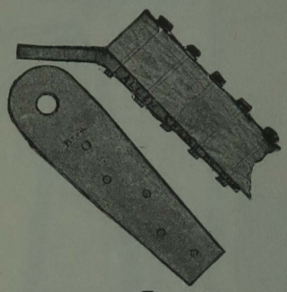


Fig. 2474
Goose Neck No. 11

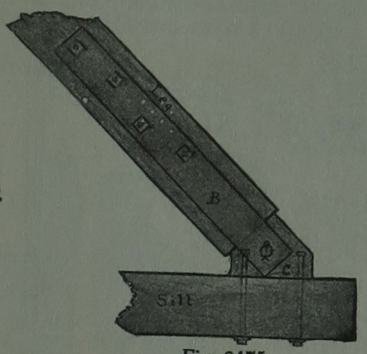


Fig. 2475
Leg and Sill Irons, No. 12

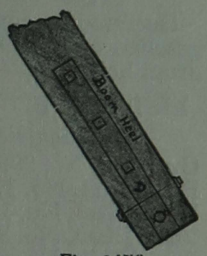


Fig. 2476
Boom Heel No. 13

Fig. 2477
U Bolt Bearings
No. 14

Fig. 2479
Plain Bearing
No. 16

Fig. 2481
Plain Bearings and
Shaft No. 18

Fig. 2483
Ball Hook
No. 20

Fig. 2484
Hook No. 21

Fig. 2485
Turn Buckle No. 22

Fig. 2486
Sling Chain No. 23

Fig. 2478
Arm Bracket
No. 15

Fig. 2480
Gin Pole No. 17

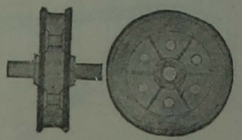


Fig. 2482
Double Flanged Wheel
No. 19

Fig. 2487
Block Weight No. 24

Fig. 2488
Swivel Hook No. 25

Fig. 2489
Shackle No. 26

Fig. 2490
Goose Neck No. 27

Fig. 2493
Steel Guy Cap
No. 30

Fig. 2491
Mast Cap No. 28

Fig. 2492
Guy Cap No. 29

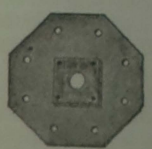


Fig. 2494
Plate Guy Cap
No. 31

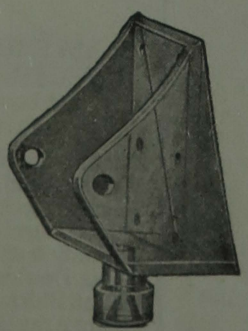


Fig. 2502
Non-Framing Foot Block

Fig. 2495
Sheave Shaft No. 32

Fig. 2498
Thimble No 35

Fig. 2499
Shackle No. 36

Fig. 2496
Clip No. 33

Fig. 2500
Double Nut Bolt No. 37

Fig. 2497
Shaft No. 34

Fig. 2501
Cast Spool No 38

DERRICKS

For the use of contractors, mills, yards, etc. Capacities up to 50 tons. Necessary fittings listed in detail with each illustration.

GUY DERRICKS WITH CRAB

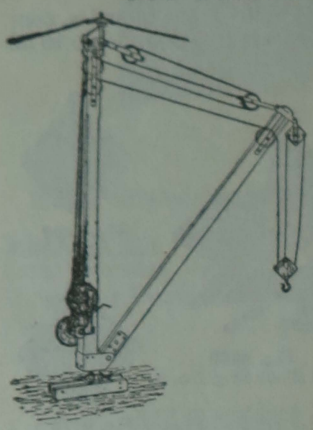


Fig. 2503

NO. 3116

LIST OF FITTINGS

One Set Each

Guy Cap, No. 29.
Mast Head, No. 3.
Double Sheave Strap, No. 9
Boom Heel, No. 13.
Foot Block, No. 4.
Foot Block Step, No. 5.
Boom End, No. 1.
Hook, No. 1.

TWO SETS EACH

Single Sheave Straps, No. 8.
Single Blocks, No. 6.
Block Weights, No. 24.

GUY DERRICKS

NO. 3102

Operated by any steam, gasoline or electric double drum hoist.

LIST OF FITTINGS

One Set Each

Guy Cap, No. 29.
Boom End, No. 1.
Boom Heel, No. 13.
Mast Head, No. 3.
Foot Block, No. 4.
Hook, No. 21.
Arm Bracket, No. 15 with 2 Sheaves.
Foot Block Step, No. 5, with 2 Sheaves.

TWO SETS EACH

Double Blocks, No. 7
Single Blocks, No. 6.
Block Weights, No. 24.

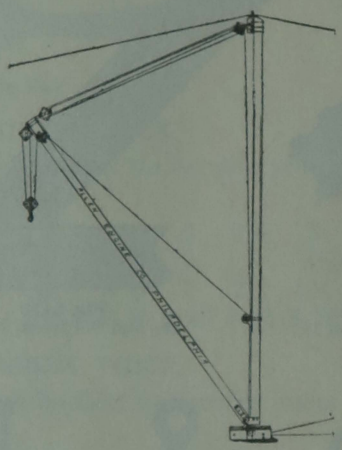


Fig. 2504

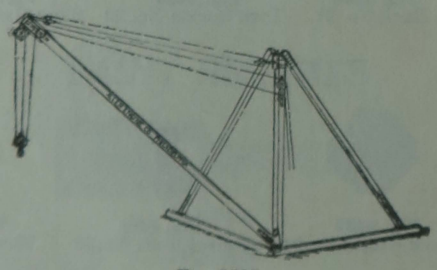


Fig. 2505

STIFF LEG DERRICKS—NO. 5012½

CRAB OPERATED.

LIST OF FITTINGS

Boom End, No. 1.
Mast Head, No. 3.
Foot Block, No. 4.
Foot Block Step, No. 5.
Hook, No. 21.
Double Sheave Strap, No. 9.
2 Single Blocks, No. 6.
2 Block Weights, No. 24.
2 Goose Necks, No. 1.
2 Sets Leg and Sill Irons, No. 12.
2 Single Sheave Straps, No. 8.

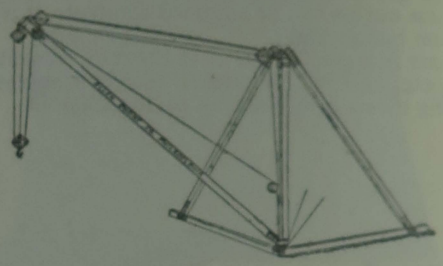


Fig. 2506

STIFF LEG DERRICKS—NO. 5008½

Operated by any electric, gasoline or steam double drum hoist.

LIST OF FITTINGS

1 Set Boom End, No. 1.
1 Foot Block, No. 4.
1 Boom Heel, No. 13.
2 Goose Necks, No. 11.
2 Double Blocks, No. 7.
2 Single Blocks, No. 6.
1 Mast Head, No. 3.
2 Sets Block Weights, No. 24
1 Pair Arm Brackets, No. 15 with Double Sheaves.
1 Set Foot Block Step, No. 5 with Double Sheaves.
1 Hook, No. 21.
2 Sets Leg and Sill Irons, No. 12.

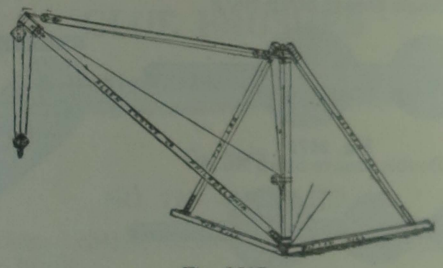


Fig. 2507

STIFF LEG DERRICKS—NO. 5002½

Operated by any electric, gasoline or steam double drum hoist.

LIST OF FITTINGS

1 Set Boom End, No. 1.
1 Foot Block, No. 4.
1 Foot Block Step, No. 5 with Double Sheaves.
2 Boom Heels, No. 13.
1 Hook, No. 21
1 Pair Arm Brackets, No. 15 with Double Sheaves.
2 Sets Leg and Sill Irons, No. 12.
2 Sets Double Sheave Straps, No. 9.
1 Mast Head, No. 3.
2 Goose Necks, No. 11.
2 Single Blocks, No. 6.
2 Block Weights, No. 24.

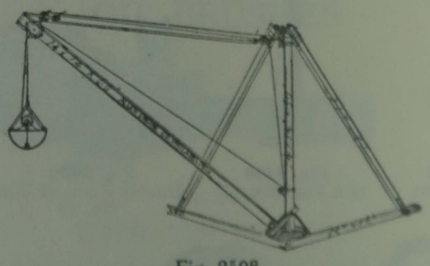


Fig. 2508

CLAM SHELL STIFF LEG DERRICKS—NO. 6010

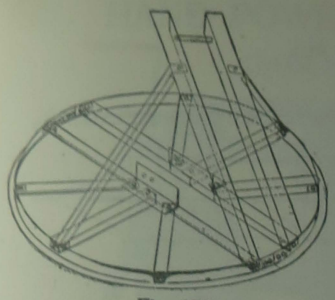
Operated by any electric, gasoline or steam three drum hoist and boom swinging gear.

LIST OF FITTINGS

1 Set Boom End, No. 1 with Double Sheaves.
1 Mast Head, No. 3.
2 Goose Necks, No. 11
1 Bull Wheel, No. 39.
2 Sets Leg and Sill Irons, No. 12.
2 Sets Double Sheave Straps, No. 9
1 Foot Block Step, No. 5 with Triple Sheaves.
1 Pair Arm Brackets, No. 15 with Triple Sheaves.
1 Foot Block, No. 4.
2 Boom Heels, No. 13

All Prices on Application

DERRICKS AND CRANES



ALL STEEL BULL WHEELS

Fig. 2509 NO. 29

FITTINGS FOR "A" FRAMES

Fig. 2510
Cross Arm Mast Head Bracket NO. 63

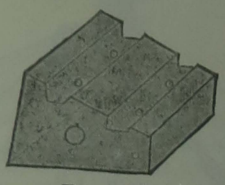


Fig. 2511
Leg Bearings NO. 64

Fig. 2512
Mast Head NO. 65

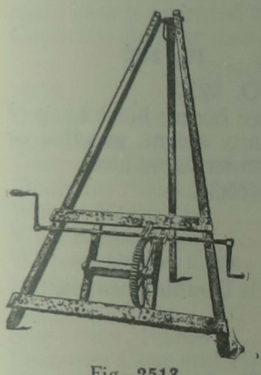


Fig. 2513
Tripod Derrick NO. 40½

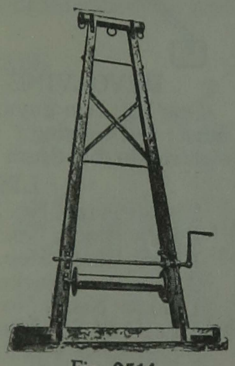


Fig. 2514
Breast Derrick NO. 40

"A" FRAMES

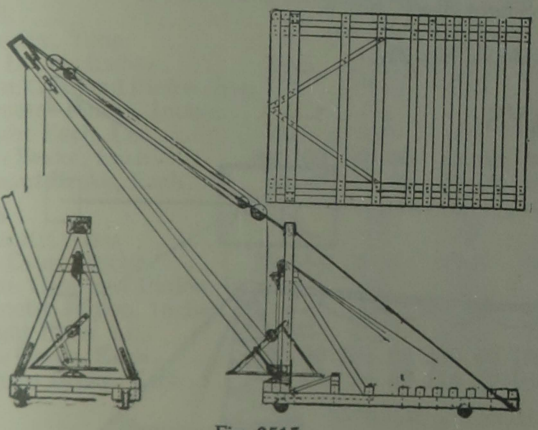


Fig. 2515
On Double Flanged Wheels—NO. 8101

For 3 drum hoist and boom swinging gears.
1 set boom end No. 1 with 2 sheaves and plates. 1 foot block, No. 4. 1 foot block step, No. 5 with 3 sheaves. 1 boom heel, No. 13. 1 set leg and sill irons, No. 12. 2 sets double sheave straps, No. 9. 1 bull wheel, No. 39. 1 set arm brackets, No. 15 with 3 sheaves. 4 double flanged wheels, No. 19. 8 plain bearings, No. 16. 1 mast head, No. 65. 1 cross arm mast head brackets, No. 63 with 3 sheaves.

Prices on Application

"A" FRAMES

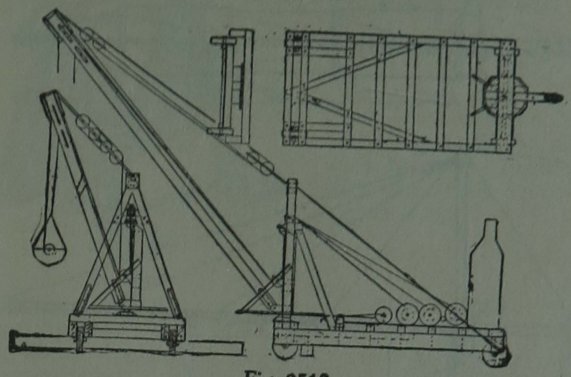


Fig. 2516
WAGON TRAVELER—NO. 8102

For 3 drum hoist and boom swinging gear.
Similar to No. 8101 except wheels are flat instead of flanged and front axle is mounted on a 36-inch diameter roller bearing fifth wheel with king pin and braces. Otherwise fittings are the same as for No. 8101.

I-BEAM BOOM FITTINGS FOR CRANES

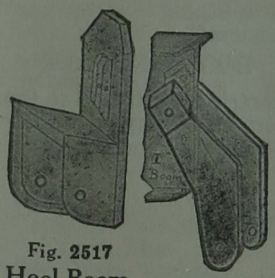


Fig. 2517
Heel Boom Seat NO. 61

Fig. 2518
End Boom Fittings NO. 62

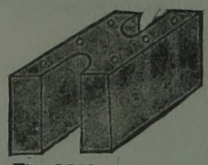


Fig. 2519
Guy Cast Thimbles NO.60

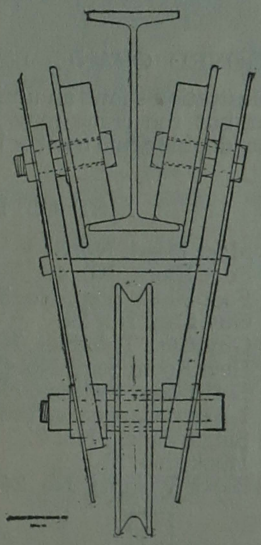


Fig. 2520
I-Beam Carrier on Trolley NO. 75

REVOLVING CANTILEVER CRANES

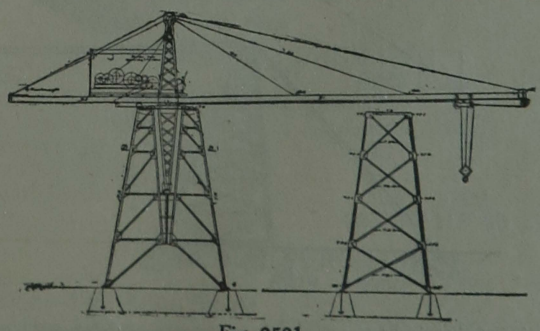


Fig. 2521
NO. 8500

For storage yards. Built of steel; furnished complete only. Operated by steam, gasoline or electric, double drum hoist and boom swinging gear.

Prices on Application

CRANES

Designed for use in storage yards, shipyards, lumber yards, etc.

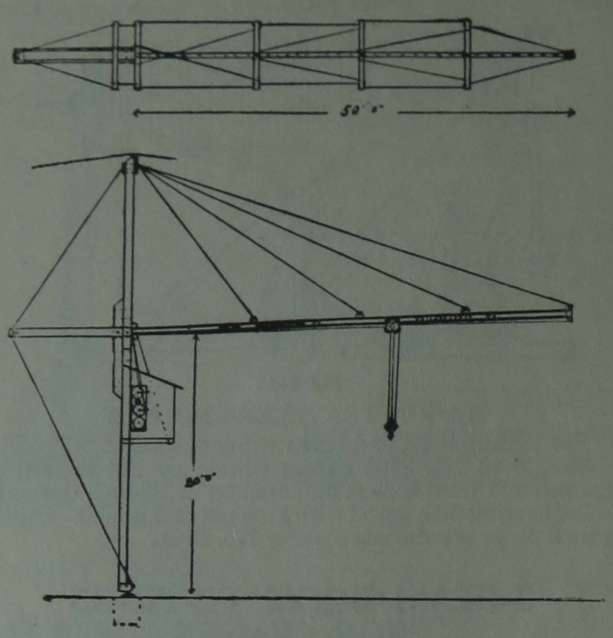


Fig. 2522

GUYED CRANE—I-BEAM BOOM—NO. 3205

Illustration shows an upright electric hoist bolted to the mast, but the crane may be operated by any electric or steam double drum hoist or by a double drum hand crab.

LIST OF FITTINGS

1 Mast Head, No. 3.
1 Foot Block, No. 4.
1 Foot Block Step, No. 5.
1 Guy Cap, No. 29.
4 Guy Cast Thimbles, No. 60.
1 Heel Boom Seat, No. 61 with Double Sheaves.
1 End Boom Fittings, No. 62 with Single Sheaves.
1 I-Beam Carrier on Trolley, No. 75.
1 Single Block, No. 6.
1 Hook, No. 21.
2 Block Weights, No. 24.

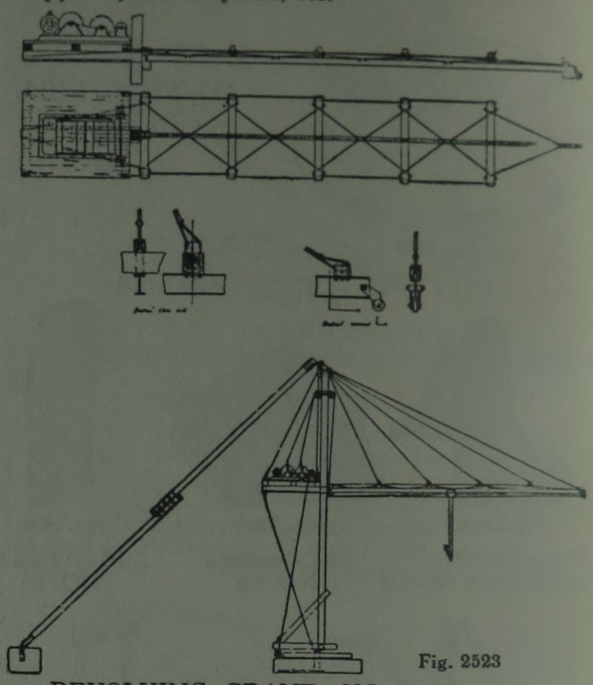


Fig. 2523

REVOLVING CRANE—NO. 3210

One leg; two guys; braced I-beam boom; hoist back of mast; self slewing. Operated by any steam, gasoline or electric double drum hoist and boom swinging gear.

LIST OF FITTINGS

1 Mast Head, No. 3.
1 Foot Block, No. 4.
1 Foot Block Step, No. 5.
2 Sets Arm Brackets, No. 15 with Double Sheaves.
1 Goose Neck, No. 11.
1 Leg and Sill Irons, No. 12.
5 Guy Cast Thimbles, No. 60.
1 Heel Boom Seat, No. 61 with Double Sheaves.
1 End Boom Fittings, No. 62 with Single Sheaves.
1 I-Beam Carrier on Trolley, No. 75 with 2 Sheaves and 4 Wheels.
1 Mast Cap, No. 28.
1 Single Block, No. 6.
2 Block Weights, No. 24.
1 Hook, No. 21.

CABLEWAYS

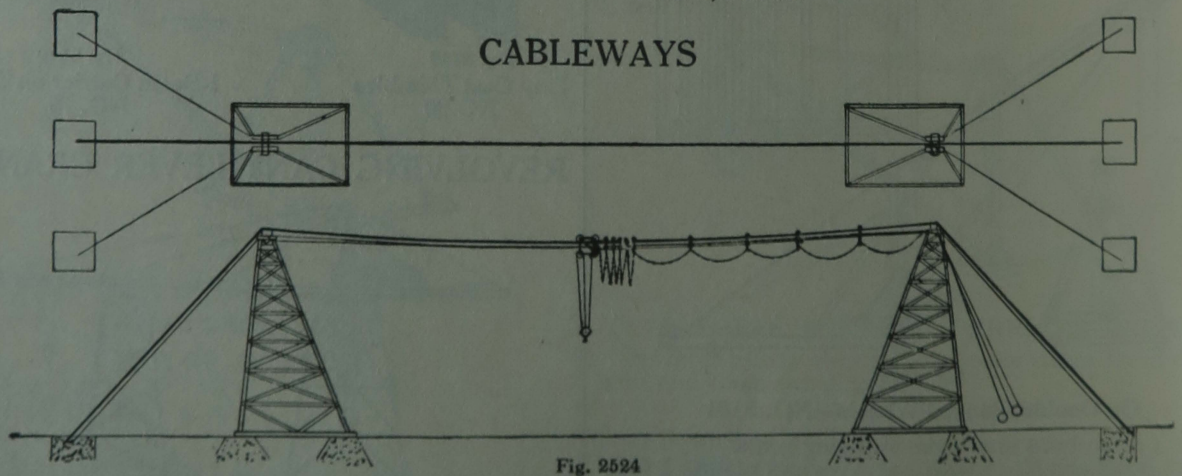


Fig. 2524

NO. 9510

With lattice towers for long spans and heavy loads; designed especially for bridges, filtration plants, stone quarries and for spanning rivers. Composed of two latticed towers on which are mounted the main cable, anchored at the two ends with each tower guyed with two guys. Carrier is operated by an engine in the rear of one of the towers with the load line at any point between the towers.

Operated by a double drum steam or electric hoisting engine with the drums reversing. Cableways and trenching machines to meet any conditions can be furnished. **All Prices on Application.**

HAND POWER WINCHES

IRON FRAME

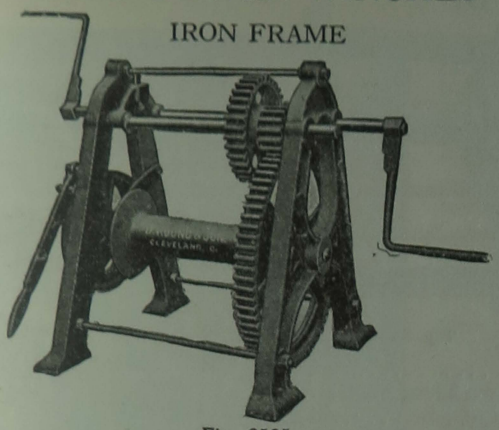


Fig. 2525

Cast iron frame, drum and gears, carefully machined. For unloading or raising heavy material. Shaft can be thrown out of gear when lowering so that handles will remain stationary. Capacities listed are based on the use of two and three-sheave rope blocks in connection with the winches. Will lift one-fifth of capacity directly from the barrel. All winches will be furnished with brakes unless otherwise ordered. In the single purchase winch the main gear is operated by pinion without intermediate gear. Capacity for four men.

SINGLE PURCHASE

NOS.	1	2	3
Capacity, Tons	2	3	4
Size Drum, Inches	13x4½	18x5	18x5
Diameter Gear, Inches	18	21	24½
Diameter Pinion, Inches	4	4	4¾
Weight Each, Lbs.	260	330	400
With Brake, Each	**$27.00**	**30.00**	**35.00**
Without Brake, Each	**22.50**	**25.00**	**29.00**

NOS.	4	5	6
Capacity, Tons	5	6	9
Size Drum, Inches	22x5½	22x5½	25x6
Diameter Gear and Pinion, Inches	24½	25½	27
Diameter Pinion, Inches	4¾	4⅞	6
Weight Each, Lbs.	550	600	625
With Brake, Each	**$40.00**	**52.00**	**62.00**
Without Brake, Each	**35.00**	**44.00**	**53.00**

DOUBLE PURCHASE

NOS.	10	11	12	13
Capacity, Tons	4	5	6	9
Size Drum, Inches	18x5	22x5½	22x5½	22x5½
Diam. Gear and Pinion, Ins.	21	24½	25½	27
Diameter Pinion, Inches	4	4¾	4⅞	6
Weight Each, Lbs.	400	430	600	800
With Brake, Each	**$40.00**	**46.00**	**59.00**	**69.00**
Without Brake, Each	**35.00**	**40.00**	**50.00**	**60.00**

NOS.	14	15	16	17
Capacity, Tons	12	15	18	24
Size Drum, Inches	25x5½	30x6	30x6	30x6
Diam. Gear and Pinion, In.	30	30	31	32
Diameter Pinion, Inches	6	6½	6½	6½
Weight Each, Lbs.	1020	1270	1300	1330
With Brake, Each	**$82.00**	**104.00**	**132.00**	**180.00**
Without Brake, Each	**73.00**	**94.00**	**118.00**	**160.00**

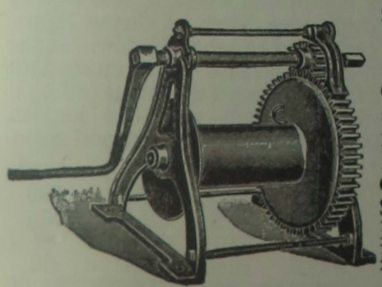


Fig. 2526

SINGLE PURCHASE

One-man capacity. Made for general use. Cast iron frame, drum and gears. Two cranks furnished.

NOS.	6320
Capacity, Lbs.	500
Size Drum, Ins.	12x5
Diam. Gear, Ins.	14
Dia. Pinion, Ins.	2½
Wgt. Each, Lbs.	100
Each	**$25.00**

HAND POWER WINCHES

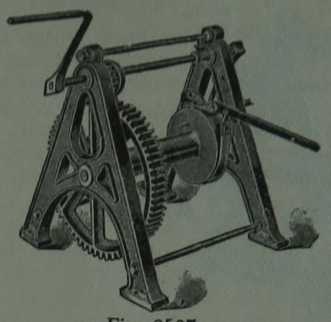


Fig. 2527

IRON FRAME

SINGLE PURCHASE

Four-men capacity, Cast iron frame, drum and gears. Single drum with brake. Furnished with one crank lever 14 inches long.

NOS.	6250	6252	6253
Capacity Two Men, Single Line, Lbs.	900	1800	2500
Size Drum, Inches	12x4½	16x4½	18x5
Diameter Gear, Inches	18	24	25
Diameter Pinion, Inches	6	4	4
Weight Each, Lbs.	265	365	400
Each	**$58.00**	**72.00**	**90.00**
Add for Nigger Head on Shaft	**14.00**	**16.00**	**17.00**

DOUBLE PURCHASE

Four-men capacity. Cast iron frame, drum and gears. Single drum with brake. Furnished with two crank levers 14 inches long.

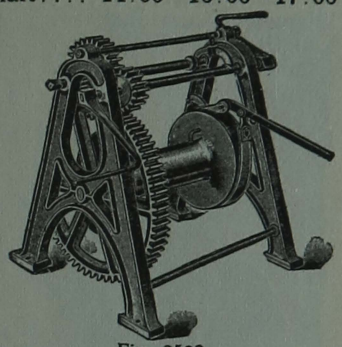


Fig. 2528

NOS.	6258	6260	6262	6263
Capacity Two Men, Single Line, Lbs.	3000	4500	5000	3000
Size Drum, Inches	16x4½	19x5	22x6½	16x9
Diameter Gear, Inches	24	27	33	25
Diameter Pinion, Inches	9,4	13½,4	13½,5½	8¼,4
Weight Each, Lbs.	425	625	800	575
Each	**$84.00**	**122.00**	**150.00**	**120.00**
Add for Nigger Head on Shaft	**17.00**	**19.00**	**20.00**	**17.00**

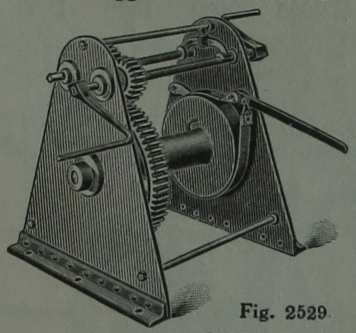


Fig. 2529

Four-men capacity. Steel plate sides; cast iron drum and gears. Single drum. Furnished with brake and two crank lever handles, 14 inches long for double purchase and with one lever for single purchase.

SINGLE PURCHASE

NOS.	6269	6271	6272
Capacity Two Men, Single Line, Lbs.	1250	2500	2000
Size Drum, Inches	14x4¼	18x5	21x6
Diameter Gear, Inches	21	25	25
Diameter Pinion, Inches	5¼	4	4
Weight Each, Lbs.	125	200	200
Each	**$84.00**	**116.00**	**116.00**

DOUBLE PURCHASE

NOS.	6278	6280	6281	6284
Capacity Two Men, Single Line, Lbs.	4500	5000	3000	4700
Size Drum, Inches	19x5	22x6½	16x9	21x9
Diameter Gear, Inches	27	33	25	28
Diameter Pinion, Inches	13½,4	13½,5½	8¼,4	10,4
Weight Each, Lbs.	725	900	550	900
Each	**$148.00**	**200.00**	**150.00**	**200.00**

HAND POWER WINCHES

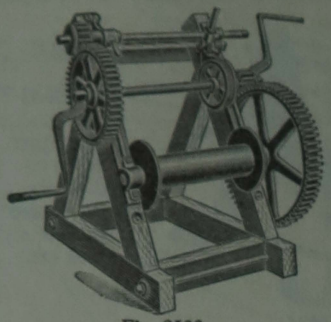


Fig. 2530

DOUBLE PURCHASE

Portable; with brake; hardwood frame; straight cast iron drum and cast iron gears; capacity for four men.

NOS.	6311	6313	6314	6315
Capacity Two Men, Single Line, Lbs.	7500	7500	5000	5000
Diameter Drum, Inches	6	6	9	9
Length Drum, Inches	21	30	16	21
Diameter Gear, Inches	28	28	28	28
Diameter Pinions, Inches	1.84	18.4	18.4	18.4
Weight Each, Lbs.	700	725	720	750
Each	$140.00	160.00	140.00	150.00

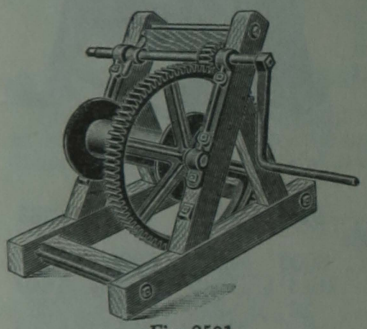


Fig. 2531

SINGLE PURCHASE

Portable; with hardwood frame; single, straight drum and gears of cast iron. Two handles furnished; capacity for four men.

NOS.	6298	6300	6301	6302
Capacity Two Men, Single Line, Lbs.	2000	2000	1500	1500
Diameter Drum, Inches	6	6	9	9
Length Drum, Inches	21	30	16	21
Diameter Gear, Inches	28	28	28	28
Diameter Pinion, Inches	4	4	4	4
Weight Each, Lbs.	440	490	430	460
Each	$70.00	76.00	70.00	74.00

SINGLE PURCHASE

Portable; with concave drum; hardwood frame; drum and gears of cast iron; two handles furnished; capacity for two men.

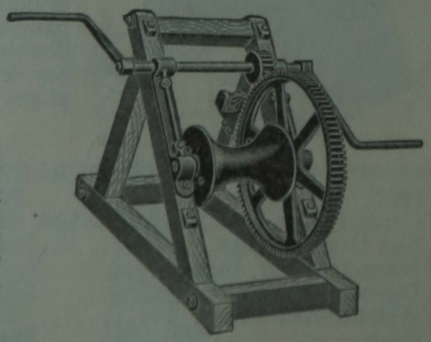


Fig. 2532

NOS.	6295	6296
Capacity Two Men, Single Line, Lbs.	1600	2000
Diameter Drum, Inches	4½	6
Length Drum, Inches	12	21
Diameter Gear, Inches	24	28
Diameter Pinion, Inches	4½	4
Weight Each, Lbs.	420	450
Each	$50.00	70.00

HAND POWER WINCHES

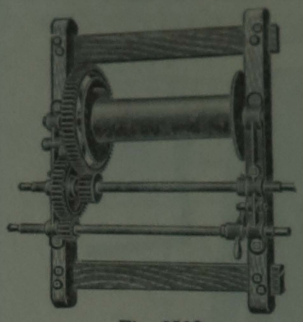


Fig. 2533

DOUBLE PURCHASE

Two speed; single drum; hardwood frame; cast iron drum and gears; capacity for two men. Capacities given in table are for slow speeds. Fast speed will lift one third of the given capacities at three times the speed.

NOS.	6336	6337	6338	6341	6342
Lift Two Men, Single Line, Lbs.	2500	2500	1800	7500	5000
Diam. Drum, Inches	4	4	6	6	9
Length Drum, Inches	16	24	21	30	16
Diam. Gear, Inches	16	16	16	28	28
Diam. Pinions, Inches	9.3	9.3	9.3	18.4	18.4
Weight Each, Lbs.	232	260	300	400	250
Each	$84.00	90.00	90.00	106.00	100.00

DOUBLE PURCHASE

Two speed; double drum; with brake; cast iron frame, drum and gears; two handles furnished; to change gear from one drum to the other, dog the gears and slide crank shaft; capacity for four men.

Note.—Capacities are for low speed; fast speed will lift one fourth this capacity at four times the speed.

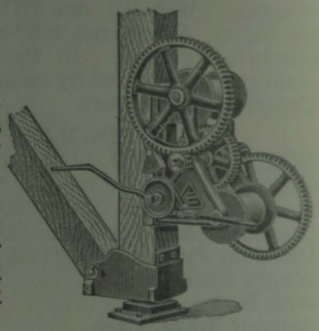


Fig. 2534

NOS.	6393	6394	6395	6396
Lift Two Men, Single Line, Lbs.	7500	7500	5000	5000
Diam. Drum, Inches	6	6	9	9
Length Drum, Inches	21	26	16	21
Diam. Gear, Inches	28	28	28	28
Diam. Pinions, Inches	18.4	18.4	18.4	18.4
Weight Each, Lbs.	1150	1150	1150	1200
Each	$150.00	160.00	150.00	160.00

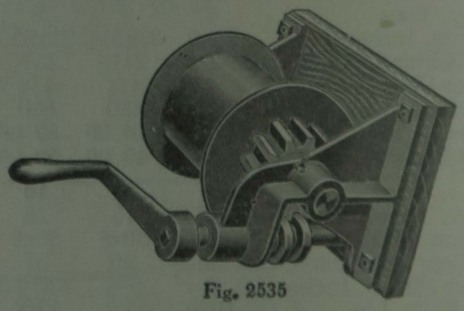


Fig. 2535

SAFETY WORM GEARED

Especially adapted for conditions where it is necessary for the load to remain suspended, such as cluster lights, sliding doors, skylights, etc.; load cannot run down, as the handle must be turned to lower the load; cast iron straight drum and base. Base may be fastened to wall or ceiling if desired. No pawl used. Furnished with one handle. No. 6316 has cut, the other sizes have cast worm and gears.

NOS.	6316	6317	6318	6319
Capacity, Lbs.	1500	500	300	500
Diam. Drum, Inches	5½	8	5½	5½
Length Drum, Inches	6	10½	6	6
Weight Each, Lbs.	85	90	50	50
Each	$55.00	30.00	18.00	24.00

REVOLVATORS

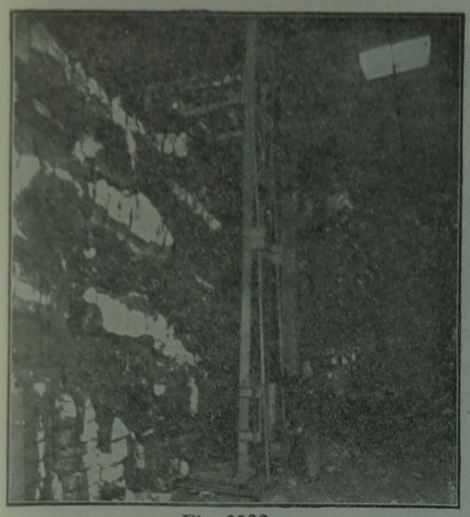


Fig. 2536
Hand Operated

A portable tiering machine or elevator, which can be wheeled to any place in a storeroom or warehouse and used for stacking barrels, boxes, bales, etc. It consists of two uprights, elevating platform, and a revolving base, which can be swung around on its own center, like a turntable. This revolving base, which is fully protected by patents, is a distinct improvement over the old type of non-revolving base machine, and makes the revolvator 100 per cent more efficient than the old style tiering machine.

A box or bale is placed on the platform when down, and by means of a crank and gears the platform is raised to any level desired and swung around on its center, convenient for unloading.

Rollers on the platform permit sliding the load from the revolvator directly into the space where it is to be stored.

The whole secret of the success of the revolvator lies in its revolving base; it is loaded with the platform facing down the aisle; then after elevating, the whole machine is swung around on a ball bearing turntable. The lower half of the base remaining stationary on the floor, the load can then be slid off the platform on either side of the aisle, or in back if so desired. The fact that the revolvator can be loaded from the front and unloaded from the rear makes it possible to stack a storeroom entirely solid.

The hand power revolvator paved the way for the motor-driven revolvator for use in large warehouses having a great deal of tiering to do.

The motor-driven machine can be operated at higher speed than the hand type, and will also elevate heavier loads. It will be furnished with any standard type motor for any voltage, frequency or number of phases. It has over-travel limit device and automatic brake. Control is by means of a simple controller box attached to the machine.

In order that the revolvator may be moved from room to room through low doorways, or placed on elevators and carried from floor to floor, the uprights are jointed, allowing the top half to fold over. To hold the revolvator rigid, so that it will not change its position in reference to the floor, a floor lock is used. Cannot upset in use. Will increase storage capacity 20 to 50 per cent. Reduces labor bills. Makes it possible to stow compactly heavy and bulky packages. Removes individual packages from any place in the warehouse and eliminates breakage, as cases do not have to pass from man to man.

Fig. 2537
Motor Driven

TABLE OF DIMENSIONS, WEIGHTS, ETC.

Motor Power, NO. R.M.	Hand Power, NO. R.F.	Height Over all, Ft.	Size of Platform, Inches				Height Floor to Top of Hinge, Feet	Height Floor to Top of Platform, Feet	Width Over All, Ins.	Length Wheel Base, Ins.	Height From Platform in Highest Pos. to Top of Machine, Ins.	Height from Floor to Top of Platform in Lowest Pos., Ins.		Approx. Weight Crated Hand Power, Lbs.
			Roller		Wood							Roller	Wood	
			Length	Width	Length	Width								
6	6	6	31	24	30	30	.....	4 4/16	38	41	20	10 3/4	10	1285
6½	6½	6½	31	24	30	30	.....	4 5/16	38	41	20	10 3/4	10	1290
7	7	7	31	24	30	30	5½	5 1/3	38	41	20	10 3/4	10	1295
7½	7½	7½	31	24	30	30	5½	5 5/6	38	41	20	10 3/4	10	1300
8	8	8	31	24	30	30	6½	6 1/3	38	41	20	10 3/4	10	1305
8½	8½	8½	31	24	30	30	6½	6 5/16	38	41	20	10 3/4	10	1310
9	9	9	31	24	30	30	6½	7 1/3	38	41	20	10 3/4	10	1315
9½	9½	9½	31	24	30	30	6½	7 5/6	38	41	20	10 3/4	10	1320
10	10	10	31	24	30	30	6½	8 1/3	38	41	20	10 3/4	10	1330
10½	10½	10½	31	24	30	30	6½	8 5/6	38	41	20	10 3/4	10	1340
11	11	11	31	24	30	30	6½	9 1/3	38	41	20	10 3/4	10	1350
11½	11½	11½	31	24	30	30	6½	9 5/6	42	41	20	10 3/4	10	1360
12	12	12	31	24	30	30	6½	10 1/3	42	41	20	10 3/4	10	1380
13	13	13	31	24	30	30	7½	11 1/3	42	41	20	10 3/4	10	1570
14	14	14	31	24	30	30	7½	12 1/3	42	41	20	10 3/4	10	1580
15	15	15	31	24	30	30	8	13 1/3	42	41	20	10 3/4	10	1590
16	16	16	36	30	36	36	8½	14	48	58	24	10 3/4	10	1905
17	17	17	36	30	36	36	9½	15	48	58	24	10 3/4	10	1980
18	18	18	36	30	36	36	9½	16	48	58	24	10 3/4	10	2005
20	20	20	36	30	36	36	10½	18	48	58	24	10 3/4	10	2080

By a change of the ratio of gear, any desired capacity can be made from 400 lbs. up to 2000 lbs.

Prices Quoted on Application

FLOOR CRANES AND HOISTS

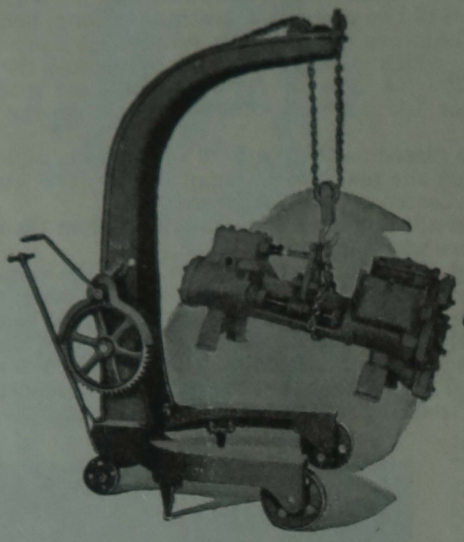


Fig. 2538

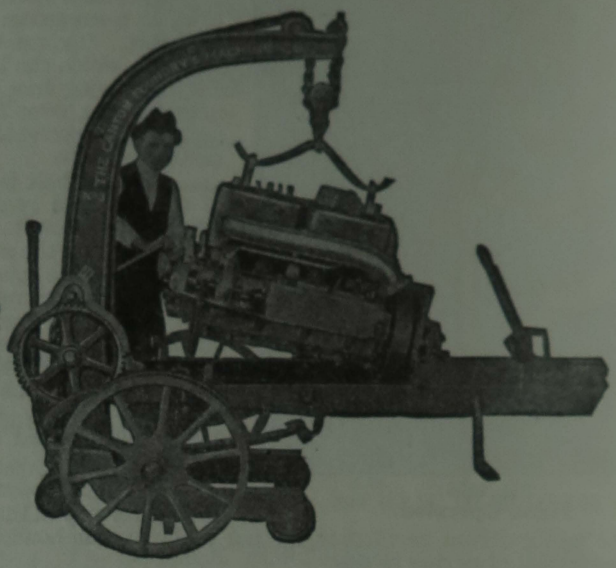


Fig. 2539

Indispensable for use in any plant where heavy work must be handled; combines both a crane and hoist that is movable, one that goes to the most remote parts of the shop, in and around machines and under balconies. Nothing else takes the place of it. Lifts work and carries it quickly to parts of the shop where nothing else can reach. It is speedy and easily handled, and enables one man to do more work in less time than six men could do without it. Even in plants elaborately equipped with overhead cranes this hoist is invaluable because it serves as an auxiliary to the larger cranes by relieving them of the smaller jobs, and by carrying work to parts of the shop where the overhead cranes cannot reach. In smaller shops it is an absolute necessity because it satisfactorily takes the place of an overhead system, at the same time serving in the capacity of a crane, hoist and truck; saves time, labor and increases production.

All cranes are tested to capacity and a good margin of safety is assured for the protection of the operator and the work being handled.

Load is raised with the lifting crank on gear shaft and can be locked at any point by means of pawl and ratchet; the yoke rests on an eccentric axle; axle is thrown back by raising handle against the arm and weight of machine then rests on front wheels. When handle is pulled down, the axle lifts weight from the wheels and the entire load is carried by yoke.

Base casting, projecting arms and gears are made from semi-steel, a mixture of Northern Iron machinery cast and about 20 per cent of steel, which produces a tougher mixture than cast iron. Projecting arms are reinforced with a heavy wrought iron band, which takes up the severe strain and enables the hoist to handle the heaviest kind of work with absolute safety. The chain, a most important feature, is a BBB guaranteed hand forged tested grade, the best quality of chain that can be produced for this particular kind of work.

The hook, block, axle, fork and yoke are high quality drop forgings having an enormous tensile strength. Wheels are equipped with Hyatt Roller Bearings, which increase the ease of operation to a remarkable degree. The base casting is reinforced at points subject to greatest strain. In selecting a crane, it is more necessary to consider height and lift than lifting capacity.

All cranes will be furnished with base 12 inches high, unless 6¾-inch height is specially ordered.

No. 1 furnished with 9-inch base.

NOS.	1	2	3	4	5	6	7	8
Total Height, Inches	68	78	90	102	114	126	138	150
Lift, Inches	54	64	76	88	99	111	123	135
Overhang, Inches	27	30	33	36	39	42	45	48
Outside Width of Bed, Inches	29	32	34	40	44	48	53	58½
Inside Width of Bed, Inches	22	25	28	32	36	40	44	49½
Length of Bed, Inches	35	38	45	48	51	54	57	61
Height of Bed, Inches	9	12	12	12	12	12	12	12
Weight Each, Lbs.	600	740	890	1150	1300	1550	1800	2000
Capacity, Lbs.	2000	4000	5000	6000	6000	6000	7000	7000
Each	$100.00	112.50	125.00	150.00	162.50	175.00	187.50	200.00

CHAIN BLOCKS

YALE-SPUR GEARED

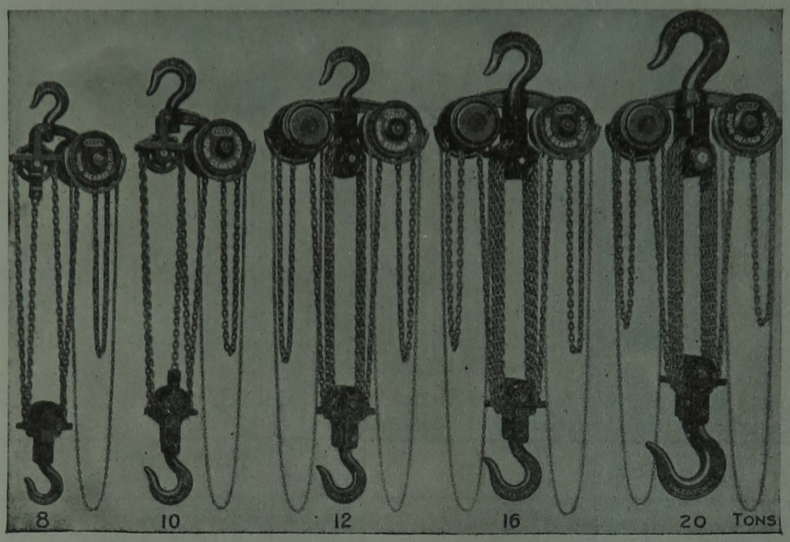


Fig. 2540

Parts are few and simple; has the greatest overload capacity; the one ton block will stand the shock of a one ton load dropping twenty-five inches without breaking. Safety top hook and crosshead are made of steel forgings, designed to swivel on the rock, permitting the block to line up with the load, and relieving the strain of side pull; steel suspension plates connect the upper hook and load sheave bearings, supporting the load; with this construction castings are replaced by wrought steel to resist shock or overload; load sheave is made with smooth, accurately formed pockets, operates with least possible wear on the chain; gear and pinion are two parts in one, cut from solid steel blank, the unusually large teeth reduce the strain and give an easy running gear system; driving pinion is a special steel forging with large teeth cut from a solid blank; the rugged design of this important part contributes to the safety of the block. The working gears act as roller bearings. From top to bottom hook the load is supported on steel and is held positively. The gears are covered by a steel case; gear pressures are balanced and there are no delicate bearings; load is hung from center of the block; continuous hand chain guide prevents gagging at high speed or side pull; chain is tested 2½ times its rated capacity; all chain welds are on the side of the links; lowers all loads smoothly. All parts from 4 to 20 tons are interchangeable with 2 ton size.

Rated Capacity, Tons of 2240 Lbs.	Test Load, Tons of 2240 Lbs.	Standard Hoist, Feet*	Min. Distance Between Hooks, Inches	Chain Pull to Lift Full Load Lbs.**	Chain Handled to Lift One Foot	Length of Load Chain, Feet	Length of Hand Chain, Feet	Weight, Lbs.	Extra Lift per Foot	Each
¼	⅜	8	13	78	8	9	16	60	$1.80	$70.00
½	¾	8	13	62	21	9	16	60	1.80	70.00
1	1½	8	16	82	31	9	16	95	1.90	90.00
1½	2¼	8	18	110	35	9	16	131	2.00	120.00
2	3	9	21	120	42	10	18	200	1.05	140.00
3	4½	10	32	114	70	24	22	210	2.10	180.00
4	6	10	37	124	84	25	24	300	3.20	220.00
5	7½	12	45	110	126	44	29	410	4.30	280.00
6	9	12	46	130	126	44	29	410	4.30	330.00
8	12	12	49	135	168	58	30	500	5.40	400.00
10	15	12	54	140	210	72	30	610	6.50	480.00
12	18	12	54	130†	126†	93	30	850	8.60	600.00
16	24	12	62	135†	168†	117	30	1050	10.80	720.00
20	30	12	70	140†	210†	146	30	1350	13.00	850.00
32 } 40 }	Prices and Full Particulars on Request.									

*Height which blocks with regular lengths of chain will hoist above level on which operator stands. †For each hand chain. **On a Basis of 2000 lbs. to the ton.

WITH HIGH SPEED SPECIAL GEARING

Have special quick speed gearing suitable for rapid work in frequent lifting of light loads; will handle light loads at double speed, but require double the chain pull; made in two sizes: ¼ and ½ ton, **each $90.00.**

YALE-SPUR GEARED

CHAIN BLOCK PARTS

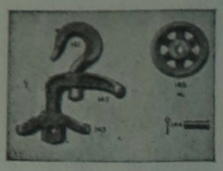


Fig. 2541

Used on Large Blocks only at Top, 3 Tons and Larger

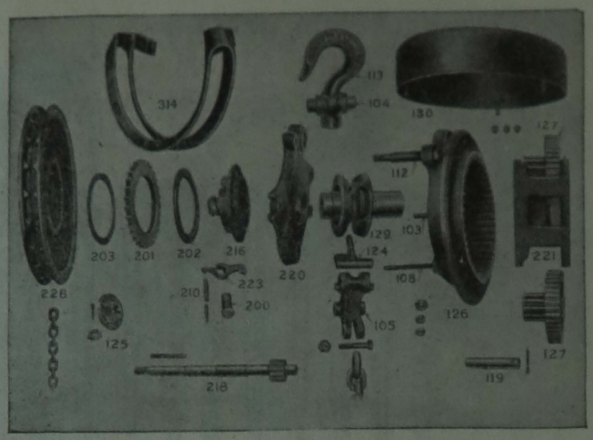


Fig. 2542

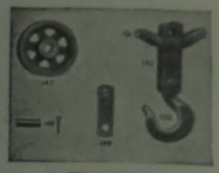


Fig. 2543

Used only on Large Blocks at Bottom, 3 Tons and Larger

Note.—In ordering parts state whether for "1898 Model" or "Model SS." Parts 104 to 223 are the same in both models. Parts 303 to 332 differ in "1898 Model" and "Model SS."

NOS.	Name of Parts	Each ½ Ton	Each 1 Ton	Each 1½ Ton	Each 2 Tons	Each 3 Tons	Each 4 to 20 Tons
104	Top Cross Head	$2.00	$2.80	$4.00	$4.80	.....	.....
113	Top Hook	2.00	2.80	3.60	4.00	.....	.....
119	Gear and Pinion Pins	.80	1.20	1.40	1.60	$1.40	$1.60
125	Check Washer	.80	1.00	1.40	1.80	1.40	1.80
127	Gear and Pinons	1.60	2.20	2.80	3.20	2.80	3.20
131	Lower Swivel Hook	3.00	4.60	6.40	11.00	.....	.....
200	Pawl Stud	.80	.80	1.00	1.00	1.00	1.00
201	Ratchet Disc	1.60	2.00	2.80	3.00	2.80	3.00
202	Leather Disc	.80	.80	1.00	1.20	1.00	1.20
203	Galvanized Iron Disc	.80	.80	1.00	1.20	1.00	1.20
210	Pawl Spring	.40	.40	.60	.60	.60	.60
214	Strap Hand Chain Guide	1.50	2.40	1.30	3.60	3.00	3.60
216	Disc Hub	3.60	4.60	6.40	8.40	6.40	8.40
221	Pinion Cage	3.20	4.20	6.40	8.40	6.40	8.40
223	Pawl	.40	.40	.60	.60	.60	.60
303	Small Separator	.80	1.00	1.20	1.40	1.20	1.40
304	Top Cross Head	2.00	2.80	4.00	4.80	.....	.....
305	Load Chain Guide	.60	.60	.80	1.00	.80	1.00
308	Load Chain Guide Bolt	.40	.40	.60	.80	.60	.80
312	Large Separator	1.20	1.40	1.60	2.00	1.60	2.00
318	Driving Pinion	6.00	8.00	10.00	12.00	10.00	12.00
320	Ratchet Case	5.00	7.00	9.00	11.00	9.00	11.00
324	Stripper	.60	.80	1.00	1.00	1.00	1.00
326	Internal Gear	4.80	6.40	10.00	12.00	10.00	12.00
328	Hand Wheel	3.60	4.60	6.00	7.20	6.00	7.20
329	Load Sheave	4.00	3.00	9.50	12.70	9.50	12.70
330	Gear Cover	2.40	4.00	3.60	4.20	3.60	4.20
332	Suspension Plate	3.00	.90	5.00	6.00	5.00	5.00
...	Load Chain, Steel, per Foot	.80	.50	1.00	1.10	1.00	1.10
...	Hand Chain, Steel, per Foot	.50	.....	.50	.50	.50	.50

In ordering load chains specify whether or not hook is required. Parts 318 and 127 should be specified "Quick Speed" for blocks so marked on the gear cover. Always give size of block. Parts 329 and 221 are a driven fit. In assembling see that the locating holes in No. 127 line up at the center.

3 TONS AND LARGER

	Top Hook No. 341, Each	Top Yoke No. 342, Each	Top Guard and Guides No. 143, Each	Top Sheave Pin No. 144, Each	Top Sheaves No. 145, Each	Bottom Sheave No. 147, Each	Bottom Sheave Pin No. 148, Each	Becket Straps No. 149, Each	Bottom Guards and Guides No. 151, Each	Bottom Side Plates and Crosshead No. 152, Each	Bottom Hook No. 135, Each
Each, 3 ton	$6.00	$12.70	.....	.....	.....	$6.00	$1.60	.....	$7.00	$6.40	$6.00
Each, 4 ton	10.00	28.60	.....	.....	.....	9.00	2.60	.....	8.00	10.00	10.00
Each, 5 ton	12.00	33.20	$9.60	$2.00	$6.00	9.00	3.00	$8.00	10.00	14.00	12.00
Each, 6 ton	14.00	40.00	14.00	3.00	9.00	12.00	4.00	12.00	14.00	18.00	14.00
Each, 8 ton	24.00	50.00	16.00	4.00	10.00	12.00	5.00	14.00	16.00	22.00	24.00
Each, 10 ton	30.00	56.00	18.00	5.00	11.00	14.00	6.00	16.00	20.00	26.00	30.00
Each, 12 ton	48.00	64.00	20.00	7.00	11.00	14.00	8.00	.....	24.00	38.00	48.00
Each, 16 ton	64.00	80.00	23.00	8.00	11.00	14.00	10.00	.....	27.00	48.00	64.00
Each, 20 ton	130.00	128.00	26.00	11.00	11.00	14.00	13.00	.....	31.00	64.00	130.00

Nos. 341 and 342 differ in "1898 Model" and "Model SS." Nos. 143 to 153 are interchangeable.

EXTENSION HAND WHEEL BLOCKS

SPUR-GEARED

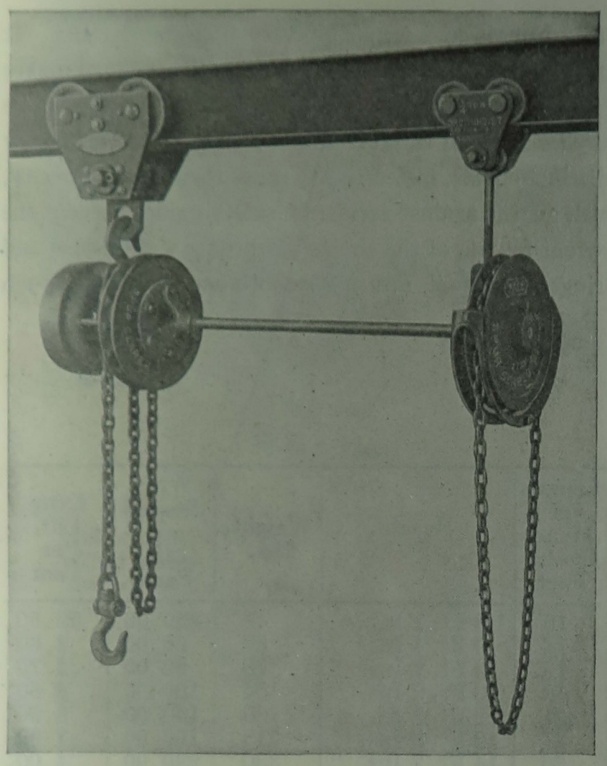


Fig. 2544

This Block enables the operator to stand back away from the load. Where it is required to lift directly over a furnace, a tank or a piece of machinery which the hand-operating chain should not come in contact with, this extension hand wheel block is particularly adaptable. The extension shaft and wheel sometimes projects as far as 8 to 10 feet out from the body of the block. Safety hook and crosshead; steel forgings designed to swivel and rock, permitting the block to line up with the load, thus relieving the strain of side pull; steel suspension plates connect the upper hook and the load sheave bearings supporting the load; steel load sheave has smooth, accurately formed pockets, and operates with least possible wear on the chain. Gear and pinion, two parts in one, are cut from a solid steel blank. The unusually large teeth reduce the strain and give an easy running gear system. Driving pinion is a special steel forging, carefully finished, with large teeth cut from the solid blank. The rugged design of this important part contributes to the safety of the block. Continuous hand chain guide prevents chain from catching or gaging at any speed or direction of pull.

Capacity, Tons	Regular Hoist, Feet	Greatest Extension, Feet	For Extra Extension, Per Foot	Block with 2-Foot Extension Without Trolleys*
½	8	8	$0.90	$110.00
1	8	8	1.10	130.00
1½	8	10	1.20	170.00
2	9	10	1.30	190.00

Trolley which supports block should be same capacity as block; trolley which supports extended hand wheel is usually ¼ ton.

*Extension means distance between centres of load and hand chain.

Information and prices of larger capacities on request.

TWIN HOOK BLOCKS

SPUR-GEARED FOR LIFTING A LOAD AT TWO POINTS

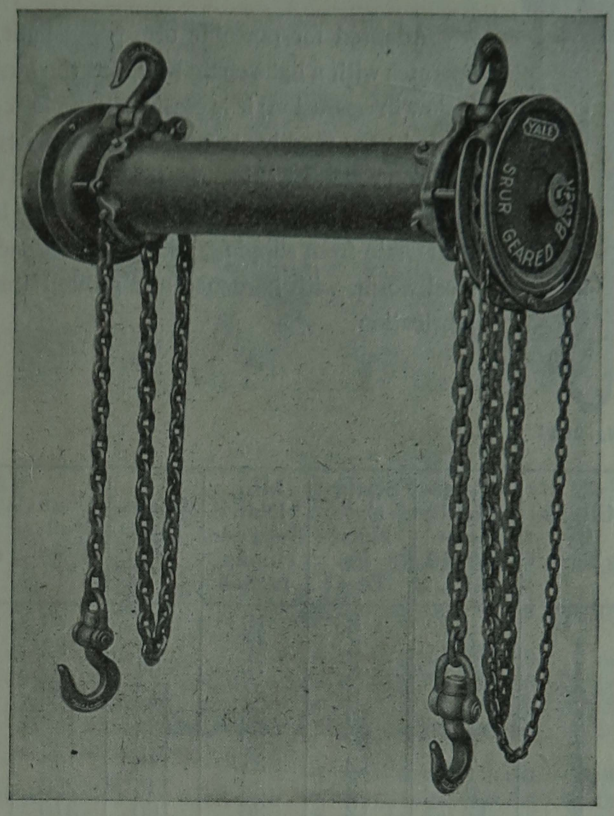


Fig. 2545

This block has one hand chain only which operates the two load hooks together, thus enabling one man to lift platforms and long pieces evenly. These Twin Hook Blocks are largely used for lifting the removable bodies on motor trucks, making a trip with one body while another similar is being filled. On return of truck, empty body is lifted off and the loaded one put on.

Capacity, Tons	Hoist, Feet*	Hand chain Pull in Lbs.	Extra Hoist, per Foot	Center Distance between Hooks 3 Feet, Each	4 Feet, Each	5 Feet, Each	6 Feet, Each
½	8	49	$2.60	$300.00	$310.00	$320.00	$330.00
1	8	82	2.80	320.00	330.00	340.00	350.00
1½	8	98	3.00	340.00	350.00	360.00	370.00
2†	9	84	3.20	400.00	410.00	420.00	430.00
3	10	102	5.00	440.00	450.00	460.00	470.00
4	10	93	5.40	500.00	510.00	520.00	530.00
5	12	116	7.60	600.00	610.00	620.00	630.00
6	12	106	7.60	700.00	710.00	720.00	730.00
8	12	114	9.80	820.00	830.00	840.00	850.00

Capacity, Tons	Hoist, Feet*	Hand Chain Pull, in Lbs.	Extra Hoist, Per Foot	Center Distance between Hooks 7 Feet, Each	8 Feet, Each
½	8	49	$2.60	$340.00	$350.00
1	8	82	2.80	360.00	370.00
1½	8	98	3.00	380.00	390.00
2†	9	84	3.20	440.00	450.00
3	10	102	5.00	480.00	490.00
4	10	93	5.40	540.00	450.00
5	12	116	7.60	640.00	650.00
6	12	106	7.60	740.00	750.00
8	12	114	9.80	860.00	870.00

*Figures denote height in feet which blocks with regular lengths of chain will hoist.

†Two tons and larger have bottom sheaves.

CHAIN BLOCKS

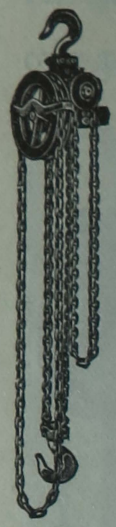


Fig. 2546

YALE—SCREW-GEARED

Adapted for portable use, being light, powerful, durable and requiring very little head room. It operates with a light chain-pull, but the large amount of overhaul of the hand chain to lift the load makes it slow in operation; it is essentially a block for riggers and for temporary and occasional service; it may be shifted very readily to meet an emergency and may be adapted to horizontal work when pulling heavy loads on rollers or skids; the load is carried on two distinct chains, tested to 2½ times their rated capacity, and having the welds all on the side of the links, which guards against accidents; safety guides prevent the load chain from slipping, and swivel connections prevent fouling of the chain; the bronze worm wheel and steel worm, with hardened and ground thrust bearings, run in oil, insuring smooth action and thorough lubrication.

Capacity, Tons	Test Load Tons of 2240 Lbs.	Standard Hoist in Feet*	Min. Dist. Between Hooks, Inches	Chain Pull, Lbs. ***	Chain Pull, Feet ***	Length of Load Chain, Feet	Length of Hand Chain, Feet	Reach **	Weight, Lbs.	With Standard Lift, Each	Extra Lift, Per Foot
½	¾	8	13	68	40	18	16	9 Ft. 1 In.	43	$50.00	$2.50
1	1½	8	16	87	59	18	16	9 Ft. 4 Ins.	57	60.00	2.60
1½	2¼	8	19	94	80	18	16	9 Ft. 7 Ins.	76	80.00	2.70
2	3	9	21	115	93	20	18	10 Ft. 9 Ins.	104	100.00	2.80
3	4½	10	25	132	126	24	21	12 Ft. 1 In.	180	150.00	3.00
4	6	10	29	142	155	24	21	12 Ft. 5 Ins.	215	190.00	1.90
5	7½	12	31	145	195	30	26	14 Ft. 7 Ins.	330	280.00	4.00
6	9	12	33	145	252	55	26	14 Ft. 9 Ins.	320	360.00	5.60
8	12	12	36	160	310	55	26	15 Ft. 0 Ins.	380	420.00	6.00
10	15	12	45	160	390	57	26	15 Ft. 9 Ins.	555	550.00	6.40

*Figures denote height in feet which blocks, with regular lengths of chain, will hoist from level on which operator stands.

**The reach is the sum of the hoist and the minimum distance between hooks. When hung at this height to lift the full hoist above the floor the hand chain of duplex blocks hangs down to within 18 inches of the floor.

***Figures denote the pull in pounds required to lift the full load and the number of feet the hand chain must be handled to lift the load one foot.

YALE—DIFFERENTIAL

Fig. 2547

An occasional service block where comparatively light loads are to be handled at rare intervals. The overhaul of hand chain is small but the pull is very hard. Hoist is easily handled and where men are available for emergency or occasional work, especially in the smaller sizes, it is a desirable block.

It has few parts and is low in cost. On account of its reliability and simplicity, it is especially adapted for use on farms and for all ordinary hoisting purposes where the higher power and durability of other more efficient blocks are not required.

The sheaves are of proper size and the chain gauged by a process which hardens it and insures its gearing accurately with the correctly formed pockets in the sheaves, consequently it runs easily under load and there is no stretching of the chain.

Capacity, Tons	Test Load, Tons of 2240 Lbs.	Regular Hoist in Feet	Minimum Distance Between Hooks, Inches	Chain Pull, Lbs.	Chain Pull, Feet	Weight, Each, Lbs.	Each	*Extra Hoist, Per Foot
¼	⅜	6	17	72	18	22	$36.00	$5.60
½	¾	7	21	122	24	30	42.00	5.60
1	1½	8	26	216	30	51	56.00	6.00
1½	2¼	8½	32	246	36	81	72.00	6.40
2	3	9	39	308	42	122	90.00	6.80
3	4½	9½	44	557	38	180	120.00	4.00

*Each Foot of Extra Hoist Includes Four Feet of Chain.

CHAIN BLOCK PARTS
YALE—SCREW GEARED

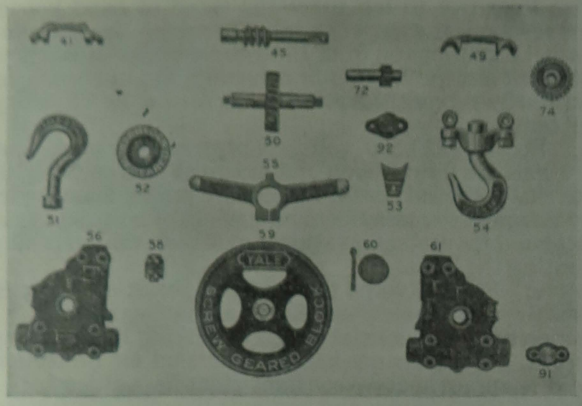


Fig. 2548

1 to 5 Tons

NOS.	Name of Parts	Each ½ Ton	Each 1 Ton	Each 1½ Tons	Each 2 Tons
41	Load chain guide, each	$0.80	$1.00	$1.20	$1.40
45	Worm and shaft, each	6.00	7.00	8.00	9.00
49	Load chain guard, each	.60	.80	1.00	1.20
50	Worm wheel, each	7.00	8.00	10.00	12.00
51	Top hook and nut, each	2.00	2.80	3.60	4.40
52	Load sheave, per pair	3.00	4.00	5.00	6.00
53	Strippers, per pair	.60	.80	1.00	1.20
54	Bottom hook swivel and eyebolts, each	4.00	5.00	6.00	7.00
55	Hand chain guide	1.80	2.00	2.60	3.60
56 } 61	Housing, each half	10.00	12.00	16.00	20.00
58	Friction plug, each	2.40	2.80	3.40	4.00
59	Handwheel (see note below,) each	3.00*	3.20*	5.00*	6.00*
60	Friction plug cover, each	.60	.60	.80	1.00
72	Pinion shaft, each	.....	...	.....	
74	Gear, each	.....	.....	.....	
91	Friction plug cover, each	.....	.....	.....	
92	Friction plug, each	.....	.....	.....	
....	Hand chain, steel, per foot*	.50†	.50†	.50†	.50†
....	Load chain steel, per foot	.75	.80	.95	.90

NOS.	Name of Parts	Each 3 Tons	Each 3½ Tons	Each 4 Tons	Each 5 Tons
41	Load chain guide, each	$2.00	$2.40	$2.80	$3.20
45	Worm and shaft, each	10.00	12.00	14.00	20.00
49	Load chain guard, each	1.40	1.60	1.80	2.00
50	Worm wheel, each	14.00	18.00	22.00	30.00
51	Top hook and nut, each	6.00	8.00	10.00	12.00
52	Load sheave, per pair	7.00	8.00	9.00	10.00
53	Strippers, per pair	1.40	1.60	1.80	2.00
54	Bottom hook swivel and eyebolts, each	9.00	10.00	12.00	16.00
55	Hand chain guide, each	4.00	4.80	5.20	5.60
56 } 61	Housing, each half	12.00	14.00	20.00	30.00
58	Friction plug, each	.....	.....	.....	.....
59	Handwheel (see note below), each	7.00	8.00	9.00	10.00
60	Friction plug cover, each	....	.....	.....	.....
72	Pinion shaft, each	8.00	8.40	8.80	9.20
74	Gear, each	3.20	3.60	4.00	4.40
91	Friction plug cover, each	1.00	1.00	1.00	1.00
92	Friction plug, each	5.00	6.00	7.00	8.00
....	Hand chain, steel, per foot*	.50	.80	.80	.80
....	Load chain steel, per foot	1.00	1.10	1.10	1.20

*In ordering handwheels or hand chain, note number of pockets for chain links in rim of wheel.

†Welded hand chain for old model blocks, .37½ per foot for ½, 1, 1½ and 2-ton sizes.

CHAIN BLOCK PARTS
YALE—SCREW GEARED

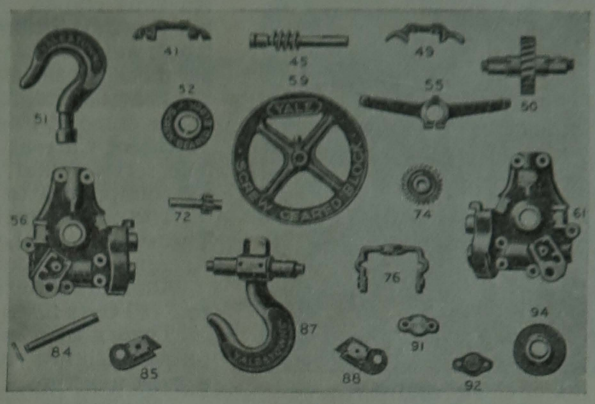


Fig. 2549

6 to 10 Tons

NOS.	Name of Parts	Each 6 Tons	Each 7 Tons	Each 8 Tons	Each 10 Tons
41	Load chain guide, each	$3.40	$3.60	$3.80	$5.00
45	Worm and shaft, each	24.00	32.00	36.00	44.00
49	Load chain guard, each	2.20	2.40	2.60	2.80
50	Worm wheel, each	32.00	36.00	40.00	50.00
51	Top hook, each	14.00	16.00	24.00	30.00
52	Load sheave, per pair	11.00	12.00	16.00	18.00
55	Hand chain guides, each	6.00	6.00	6.00	8.00
56 & 61	Housing, each half	32.00	36.00	40.00	60.00
59	Handwheel, each	10.00	10.00	13.00	14.00
72	Pinion shaft, each	9.60	10.00	10.40	12.00
74	Gear, each	4.60	4.80	5.00	6.00
76	Bottom guides, per pair	9.00	10.00	6.00	14.00
84	Clevis pin, each	1.00	1.20	1.40	2.00
85 & 88	Strippers, per pair	3.00	4.00	5.00	7.00
87	Bottom hook and crosshead, each	24.00	32.00	40.00	50.00
91	Friction plug cover, each	1.00	1.00	1.20	1.20
92	Friction plug, each	8.40	8.80	9.20	10.80
94	Bottom sheaves, per pair	6.00	8.00	12.00	14.00
.....	Load chain, per foot	1.00	1.10	1.10	1.20
.....	Hand chain, steel, per foot	.80	.80	.80	.80

Nos. 72, 74, 91 and 92 in above illustration are also used in the 3, 3½, 4 and 5-ton sizes.

YALE—DIFFERENTIAL

NOS.	Name of Parts	¼	½	1
11	Top yoke and hook	$6.00	$7.50	$9.00
12	Top sheave	7.20	9.60	12.00
13	Bottom sheave	1.80	2.60	3.00
14	Bottom yoke and hook	4.50	6.00	7.50
15	Top sheave, pin	.80	1.00	1.00
16	Bottom sheave pin	.60	.80	.80
	Regular chain	30.80	36.40	45.00

NOS.	Name of Parts	1½	2	3
11	Top yoke and hook	$11.00	$15.00	$22.00
12	Top sheave	16.80	24.00	31.20
13	Bottom sheave	3.80	4.50	7.50
14	Bottom yoke and hook	9.00	11.00	16.00
15	Top sheave, pin	1.20	1.20	1.40
16	Bottom sheave pin	1.00	1.00	1.20
	Regular chain	52.80	61.20	76.00

ELECTRIC HOISTS

YALE—CABLE TYPE

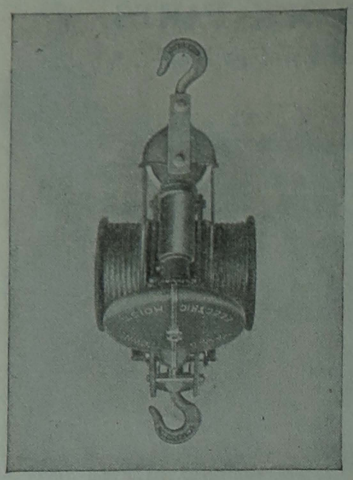


Fig. 2550

Electric hoists are in a class midway between chain block and heavy duty traveling cranes. They give from five to ten times the speed of hand hoists. For constant lifting they are economical even when substituted for the cheapest labor; will operate under normal conditions on from 15 to 40 cents' worth of power per day. In the average shop an electric hoist is as necessary and important as the heavy crane, for by constantly serving the latter it increases the efficiency of the crane at least 50 per cent.

Direct Current Motors. For 110-220-500 volts. These are enclosed, four pole, series wound; armature coils are form wound and mounted on a spider with the commutator to facilitate shaft renewal; brush holders are strong and simple.

The motors are specially designed to meet the requirements of hoisting work. The windings are heavily insulated for protection against moisture; the parts may be removed without dismounting the hoist.

Alternating Current Motors. For 220 volts, two or three phase, sixty cycles and 440 volts three phase, sixty cycles; single phase hoists are not supplied.

These are enclosed induction motors of special design to develop high starting torque with low current inrush. Windings are heavily insulated for protection against moisture. The speed is approximately constant regardless of load.

Controllers. Cylinder drum type; fingers and contacts liberally constructed for hoisting work; contacts adjustable and can be easily renewed. Controller operated by pendant ropes and has automatic spring return. Liberal spacing and deflectors provided to prevent arcing when breaking heavy currents.

Rheostat. Resistance units are of the flat type and are easily accessible. Windings are covered with an insulating cement which prevents oxidation from moisture or acid fumes; this compound is fire, water and acid proof. Rheostats are used on direct current hoists only; alternating current hoists do not require rheostatic control.

Suspension. Suspension members are steel, so that the load is supported on, from "Hook-to-hook-a-line-of-steel." Steel suspension plates facilitate attachment to overhead trolleys.

Automatic Emergency Stop. "KY" type hoists have adjustable emergency stop which automatically shuts off the controller when the top and bottom limits of hook travel are "reached."

Triplex type has lever operated emergency stop with rack connection to controller cylinder.

Brake. Load is sustained at all times by the interlocking gearing in the "KY" type machine. A brake operated by a tension spring grips the pulley attached to the end of the armature shaft.

Gearing. Strong and simple in construction. Main gearing runs at all times in a bath of oil. Special attention has been given to remove every possibility of endangering the lives of workmen or incurring breakage through the dropping of the load.

Lubrication. All important bearings are equipped with grease cups or oil ring bearings so that the minimum of care and attention is required. The main gears run submerged in a bath of oil.

Over-Load Test. Before shipment, each hoist is given a long running test and required to lift a 50 per cent overload.

Service Specifications. Inquiries and orders should specify the kind of lifting, the average and maximum load, the height of lift and the interval between lifts. This will determine the size of hoist required to handle the work. Kind of current, voltage, phases and cycles should be given. Single phase alternating current cannot be used.

Capacity, Tons	Current	Hoisting R.P.M.		Lift in Feet		Minimum Distance Between Hooks, Inches	Weight Each, Lbs.	Each with Standard Lift and Plain Control
		Loaded	Light	Standard	Maximum			
1	Direct	20	38	15	45	52	640	.....
1	Alternating	16	17	15	45	46	590	.....
2	Direct	15	38	15	45	52	640	.....
2	Alternating	15	17	15	45	46	590	.....
4	Direct	7½	19	15	22	57	790	.....
4	Alternating	7½	8½	15	22	57	740	.....
5	Direct	16	40	15	45	74	1650	.....
6	Direct	5	13	10	15	67	850	.....
6	Alternating	5	6	10	15	65	800	.....
10	Direct	8	20	15	22	81	2100	.....
10	Alternating	7½	8½	15	22	78	2100	.....

YALE—CHAIN TYPE

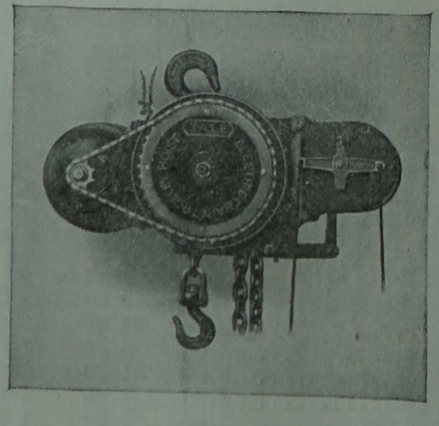


Fig. 2551

This hoist takes the place of a chain block at moderate additional cost; and gives from 5 to 10 times the speed; where any quantity of material from 50 to 4,000 pounds, has to be repeatedly lifted and lowered, this type of hoist is recommended. The installation involves simply hooking the hoist into a firm support and attaching wires for current.

Capacity, Tons	Width Over All D.C., Ins.	Min. Distance between Hooks, Ins.	Lgth. Over All, Ins.	Min. Headroom Clevis Connection, Ins.	Standard Lift, Feet	Wgt. Each, Lbs.	Standard Lift		With Extra Lift, Each
							Direct Current, Each	Alternating Current, Each	
½	16	20	33½	22	10	220	....	....	....
1	18⅝	25	38¼	28	10	360	....	....	....
2	18⅝	32	38¼	35	10	410	....	....	....

Can be furnishd for use on 110, 220 and 500 volts direct, and 220 volts two or threee phase sixty cycle, and 440 volts three phase sixty cycles alternating current. **All Prices on Application**

CHAIN BLOCKS AND TROLLEYS

YALE—SPUR GEARED

With Clevis Connections

Fig. 2552

Facilitates the transportation of heavy material within a plant; requires no floor space or cleared passage; as the chain block and trolley run on an overhead I-beam track, one man is enabled to move loads twenty times as heavy as he could on a floor truck. In making an estimate on a track system it is necessary that a plan be submitted indicating the extent and position of the tracks, curves and switches, the overhead beams and other construction from which the track is to be supported; each trolley has four wheels set at an angle so that there is no grinding action as the trolley travels on the beveled edge of the I-beam track; suspension members are of steel and arranged so that the lines of force due to the load center at the point where the hoist is hooked into the trolley; each wheel is fitted with a steel axle which turns in self-oiling bronze bearings, which are carried in the outer side plate of the trolley and the inner bearing plate; cavity holds oil and waste sufficient to keep the bearing lubricated for six months; can be furnished with either plain or geared trolley.

Capacity, Tons	Standard Sizes of I-Beam, Inches	Regular Hoist, Feet	Minimum Distance from Bottom of I-Beam to Inside Lower Hook, Inches	With Plain Trolley		With Geared Trolley	
				Weight Each, Lbs.	Each	Weight Each, Lbs.	Each
½	5	8	14	30	$110.00	76	.....
1	6	8	18	50	140.00	115	$180.00
1½	7	8	21	95	180.00	160	220.00
2	8	9	22	115	210.00	248	250.00
3	9	10	34½	150	260.00	256	300.00
4	10	10	38½	210	320.00	356	360.00
5	12	12	42	270	410.00	482	460.00
6	15	12	43	350	490.00	482	530.00
8	20	12	48	420	590.00	576	610.00
10	24	12	49	550	700.00	700	740.00

ARMY TYPE

Similar to those with clevis connections, but they take up no more space than that ordinarily required for the track and trolley alone; this is of great importance where it is desired to lift a load close to the ceiling, as in factories and warehouses where the ceilings are low; trolley blocks in larger capacities than 2 ton have a bottom block.

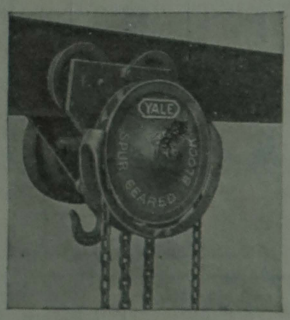


Fig. 2553

Capacity, Tons	Hoist, Feet*	Size of I-Beam, Inches	Minimum Distance between Hook & I-Beam, Inches	Clearance between Bottom of Beam and Top of Load Chain, Inches	Extreme Width, Inches	Weight, Lbs.	Each, Complete	Extra Hoist, per Foot
½	8	5	8½	½	12¾	105	$126.00	$1.80
1	8	6	10½	⅝	14¼	168	150.00	1.90
1½	8	7	12	¾	17	210	200.00	2.00
2	9	8	15	1¼	19	280	240.00	2.10
3	10	9	24	¾	19	385	340.00	3.00
4	10	10	27½	1¼	19¾	530	380.00	3.20

Additional price for widening to suit larger beams, $15.00.

*The "Hoist" is the travel of hook from the floor to the highest point. The greatest height to the bottom of the I-Beam for which this hoist is suitable is the sum of the "hoist" and the minimum distance between hook and I-beam; at this height the hand-chain hangs down within 18 inches of the floor.

When ordering parts, specify capacity, model and size of I-beam.

STEEL TROLLEYS

BROWNHOIST

Requires no floor space or cleared passage; as the chain block and trolley run on an overhead track, heavy material within a plant may be handled very readily, one man being capable of moving loads twenty times as heavy as he could on a floor truck.

In making an estimate on a track system, it is necessary that a plan be furnished indicating the extent and position of the tracks, curves and switches; also showing the overhead beams and other construction from which the track is to be supported. Suspension members are of steel and so arranged that the lines of force due to the load center at the point where the hoist is hooked into the trolley; I-beam trolleys have four wheels set at an angle so that there is no grinding action as the trolley travels on the bevelled edge of the track. Wheels are fitted with a steel axle which turns in self-oiling bronze bearings, which are carried in the outer side plate of the trolley and the inner bearing plate; cavity holds oil and waste sufficient to keep the bearing lubricated for six months; can be furnished either plain or geared.

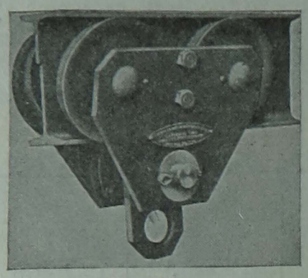


Fig 2554
Plain

PATENT STEEL TROLLEYS

Built of steel and designed to withstand severe service; fitted with roller bearings or bronze, self-oiling bearings. The geared trolley is operated by a sprocket wheel and hand chain.

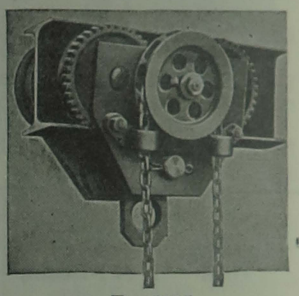


Fig. 2555
Geared

Capacity, Tons	Standard Size of I-Beam, Inches	Greatest Distance Between Supports, Feet	Smallest Radius for I-Beam Curve, Inches	Diameter Tread of Wheels, Inches	Plain Pull to Start Trolley on Track, Lbs.	Geared Pull on Hand Chain to Start, Lbs.	Plain Weight Each, Lbs.	Geared Weight Each, Lbs.	Plain, Each	Geared, Each
¼	4	13	18	3	25	....	25	....	$28.00	....
½	5	14	21	3¾	26	.....	30	....	32.00	....
1	6	14	21	4¾	47	15	50	90	40.00	$80.00
1½	7	15	30	5½	65	24	95	140	50.00	90.00
2	8	16	36	6½	74	23	115	170	60.00	100.00
3	9	16	42	7¼	45	16	150	180	80.00	120.00
4	10	16	48	8¼	50	18	210	350	100.00	140.00
5	12	18	54	10	60	20	270	360	130.00	180.00
6	15	22	60	10	70	23	350	460	160.00	200.00
8	20	29	60	12	90	28	420	540	190.00	220.00
10	24	34	60	13	115	35	550	650	220.00	260.00
12	24	23	60	13	150	42	600	700	220.00	260.00
15	24	20	96	18	180	44	1,100	1,400	360.00	440.00
20	24	16	120	18	260	49	1,200	1,500	400.00	500.00

CAST IRON TROLLEYS

Similar in appearance to the steel trolley, but made of cast iron.

Capacity Tons	Standard I-Beam, Ins.	Minimum Radius Curved, Inches	Weight Each,	Plain Bearings, Each	Roller Bearings, Each
¼	4	18	16	$14.00	.....
½	5	21	27	16.00	.....
1	6	21	52	21.00	$35.00
1½	7	30	73	27.00	44.00
2	8	36	93	35.00	54.00
				.....	75.00

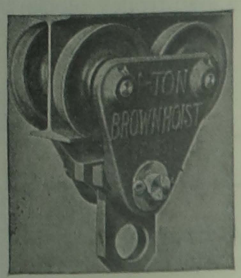


Fig. 2556

FLAT RAIL TROLLEYS

Made to run on flat steel bars; the geared trolley is fitted with hand chain and sprocket wheels.

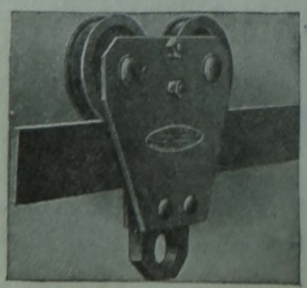


Fig. 2557

Capacity, Tons	Size of Rails, Inches	Greatest dist. Between Hangers, Feet	Plain Weight Each, Lbs.	Geared Weight Each, Lbs.	Plain, Each	Geared, Each
¼	3x½	6	28	.....	$18.00	.....
½	3x½	5	28	.....	18.00	.....
1	4x¾	6	62	94	30.00	$70.00
1½	4x¾	5	62	94	30.00	70.00
2	4x¾	4	62	94	30.00	70.00
3	6x1	6	135	200	60.00	100.00
4	6x1	5	135	200	60.00	100.00

STEEL CHAIN HOISTS

WRIGHT—HIGH SPEED

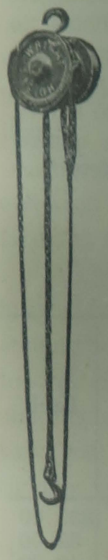


Fig. 2558
¼, ½, 1 and 2 Tons

Fig. 2559
3 and 4 Tons

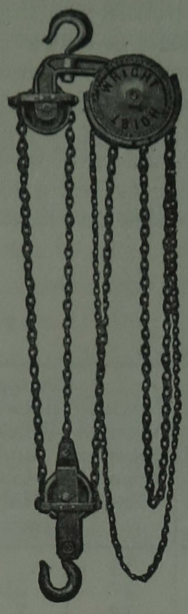


Fig. 2560
5, 6 and 8 Tons

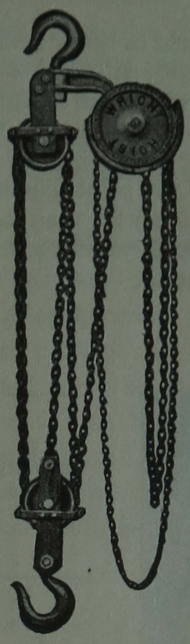


Fig. 2561
10 Tons

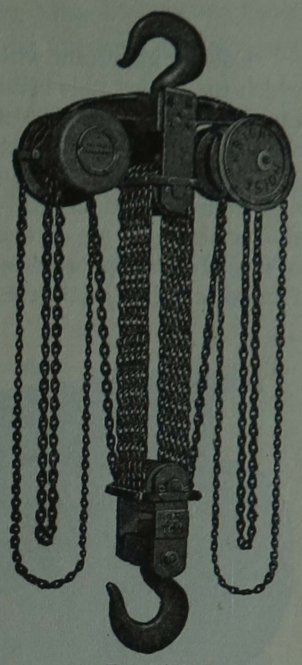


Fig. 2562
12 to 20 Tons

Adapted for loads of any size which must be raised or lowered through excessive distances, and the speed at which loads can be handled makes this hoist particularly valuable where circumstances necessitate frequent raising or lowering of material.

Hoists are spur-geared, and by the adoption of the planetary system of gearing an efficiency of 80 per cent is obtained, which is 100 per cent higher than that of a screw geared hoist and 175 per cent higher than that of a differential hoist. With a one-ton hoist one man can lift the full load by overhauling 30 feet of chain and a pull of 82 pounds, while with a two-ton size it requires 120 pounds pull and a hand chain overhaul of 40 feet.

The non-fouling chain guide permits raising and lowering the load by a chain pull from any angle without any jerking or catching of the chain.

Every working part is made either of steel or malleable iron and is capable of withstanding loads very much heavier than the rated capacity. Expense and inconvenience of replacing worn or broken parts is reduced to a minimum. The main driving shaft and pinion are made from a nickel carbon steel forging of the very highest quality; load chain wheel is a crucible steel casting and will not break. Ratchet case and internal gear frame are of malleable iron; load chain is of the best and will work at from three to four times the capacity of the hoist; the hook will safely carry load of from five to six times the hoist capacity without bending, and will straighten out before breaking. The entire hoist is so constructed as to give a wide margin of safety for both the load and the operator.

Capacity, Tons	Regular Hoist, Feet	Reach, Feet	Minimum Distance Between Hooks, Inches	Chain Pull to Lift Full Load, Lbs.	Chain Handled to Lift One Foot, Feet	Weight Each, Lbs.	Extra Lift, per Foot	Each
¼	8	9¼	15	60	10	67	$1.80	$70.00
½	8	9¼	15	60	20	67	1.80	70.00
1	8	9 5/12	17	80	30	95	1.90	90.00
1½	8	9 7/12	19	110	33	140	2.00	120.00
2	9	11	24	120	40	213	2.10	140.00
3	10	12⅔	32	110	66	228	3.00	180.00
4	10	13 1/12	37	120	80	317	3.20	220.00
5	12	15¾	40	105	120	430	4.30	280.00
6	12	15⅚	40	120	120	430	4.30	330.00
8	12	16¼	51	135	168	504	5.40	400.00
10	12	16¾	57	130	200	624	6.50	480.00
12	12	16¾	57	130	120*	909	8.60	600.00
16	12	17	60	130	160*	1121	10.80	720.00
20	12	18	75	135	200*	1635	13.00	850.00

Note.—Sizes 3 to 20 tons have lower blocks. *For each hand chain.

STEEL TROLLEYS

WRIGHT

Equally important with the raising of heavy loads is their transference through the shop; the overhead I-beam on which the trolley runs is more efficient as it requires no floor space or cleared passage, is convenient and much faster. Constructed with solid steel plates; wheels are straight faced and stand at an angle to the vertical or perpendicular to the I-beam flange. Wheels are supported on heavy steel pins, securely riveted to the plates, and on all sizes larger than one-ton run on good substantial roller bearings; equalizing pin connecting the two halves of the trolley may be taken out and trolley placed on the I-beam at any point; pin also permits the use of washers to further separate the two halves, thus enabling its use on sizes of I-beam other than standard; pin also serves to so equalize the load that one quarter of it is always supported by each wheel; various tests of the trolleys have shown them to have a factor of safety from four to seven times their rated capacity.

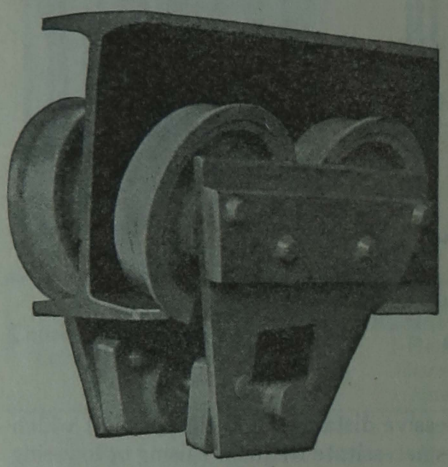


Fig. 2563

PLAIN

Capacity, Tons	Standard Size of I-Beam, Inches	Greatest Distance Between Supports, Feet	Distance Between Wheels and Hook Hole, Inches	Length Over All, Inches	Width Over All, Inches	Weight Each, Lbs.	Each
¼	5	14	....	....	....	30	$32.00
½	5	14	5¼	10	6½	38	32.00
1	6	14	7	12½	8	85	40.00
1½	7	15	7½	14	8½	110	52.00
2	8	16	8	16	9	125	56.00
3	9	16	9	19	10	135	66.00
4	10	16	9	21	10½	200	74.00
5	12	18	9¼	25	12	265	86.00
6	15	22	10½	25	12½	340	110.00
8	20	29	12	29	14	405	140.00
10	24	34	13	30	16	535	170.00

GEARED

Identical with the plain trolley but is fitted with hand chain and sprocket wheel; gears are constructed of high grade crucible steel with accurately cut teeth throughout; sprocket wheel of malleable iron with guards to prevent the chain from catching or slipping off; chain, of the very highest quality, will stand hard usage.

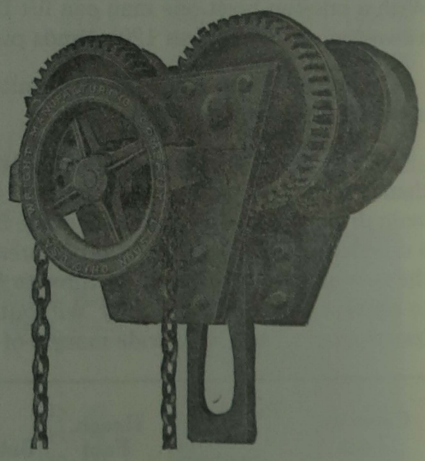


Fig. 2564

Capacity, Tons	Standard Size of I-Beam, Inches	Greatest Distance Between Supports, Feet	Distance Between Wheel and Hook-Hole, Inches	Length Over All, Inches	Width Over All, Inches	Weight Each, Lbs.	Each
1	6	14	7	12½	9½	105	$70.00
1½	7	15	7½	14	11	145	76.00
2	8	16	8	16	12	180	80.00
3	9	16	9	19	13	225	94.00
4	10	16	9	21	13¾	310	104.00
5	12	18	9¼	25	15	375	130.00
6	15	22	10½	25	16	445	160.00
8	20	29	12	29	17½	540	190.00
10	24	34	13	30	18½	640	230.00

PNEUMATIC HOISTS

Can be adapted to a great many uses; the pendant types to ordinary hoisting at various speeds desired and delicate hoisting with extremely sensitive regulation of speeds as required in foundries for setting cores, and the bracketed types for pushing and pulling, operating furnace doors quickly and without jar (in enameling furnaces) and charging and discharging ovens and furnaces. Horizontal, bracketed hoists are usually rope compounded.

While the price of these hoists compares favorably with that of chain blocks, they are much faster, require less headroom, have a lower maintenance cost, and are power hoists instead of hand hoists. These hoists are especially desirable in warehouses, basements, printing offices, under balconies and similar locations where headroom is an important item.

Hoists also adapt themselves to difficult ash and coal handling problems. They are simple, easy to understand and keep in repair, not affected by warmth, moisture, ash or coal dust and can be operated by the roughest class of labor, at the same time are much less expensive than any electrical equipment.

All hoists are suitable for pressure up to 110 lbs.; cylinders are made of steel tubing, ground and polished on the inside, giving maximum strength with least possible weight; cast steel upper heads, screwed to cylinders and cast steel stuffing box head, with gland and die-cast piston rod bushing on small sizes, brass rings on large sizes. Head bolted to screw rings; cast steel rings, screwed to cylinder; plain, bracket or plate type, special hydraulic piston leathers; removable pistons. Bronze disc valve seating on a cast iron body and at all times held by pressure against the body. The valve seat and disc are ground together, and as the disc continually grinds itself against the seat, the valves will remain tight for years. Impossible to assemble valve parts incorrectly.

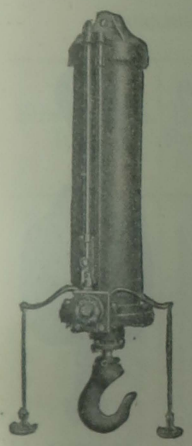


Fig. 2565

PENDANT TYPES

Class A are single acting with admission and exhaust of air on stuffing-box side only. They are intended for ordinary hoisting, such as loading wagons, handling empty flasks, structural steel, etc., where a delicate control is not necessary. They are regularly furnished with cast steel ball and socket hooks and carried in stock in 4, 5 and 6 foot lengths.

Class G are air balanced with full pressure on stuffing-box side of piston at all times. The load is hoisted by exhausting air and lowered by admitting air, above the piston, the unbalanced area of the rod forcing the piston down. These hoists have a splendid speed control and are used for the most delicate hoisting, such as in foundries for setting cores, closing molds, drawing patterns, and pouring hot metal. Only one cylinder full of air is used for hoisting, none for lowering. Carried in stock in lengths of 4, 5 and 6 feet. Clevis may be substituted for standard ball and socket hook without extra charge on either Class A or G.

BRACKETED TYPES

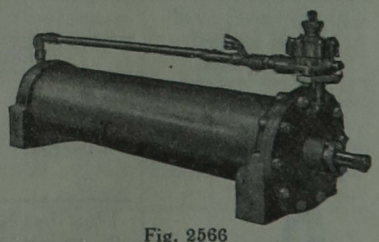


Fig. 2566

Class H are air balanced the same as Class G, but are furnished with bracketed rings and end of rod threaded—made to pull only. Unbalanced area of piston rod gives sufficient power to return piston. End of rod threaded unless otherwise specified, or clevis furnished without extra charge. Illustration shows this hoist with cushions and speed boxes which regulate the speed in either direction independent of each other, making the hoist stop at the end of the stroke without jar. Each cushion can also be regulated delicately and independently. Cushions and speed boxes can be furnished on any Curtis hoist.

Class J are double acting and bracketed, with admission and exhaust of air on both sides of the piston. They must be used whenever both powerful push and pull on the rod are required. End of rod is threaded unless otherwise specified. Clevis furnished on rods without extra charge. Valve attached or detached. Can be made with enlarged rod if required.

All hoists are made in all capacities from 860 pounds to 20,900 pounds. Four foot lifts, although any additional lengths may be had. Maximum capacities of hoists are obtained with 80 pounds of air, allowing 10 per cent loss for friction.

Prices on Application.

WOOD TACKLE BLOCKS

REGULAR INSIDE IRON STRAPPED

Lignumvitae or Iron Sheaves; varnished hardwood shell. Will be furnished with either loose side hook or loose swivel hook at the list prices given below.

SINGLE SHEAVES

Fig. 2567

Dimensions			Weight Each, Lbs.	With Loose Side Hooks			With Loose Swivel Hooks		
Sheaves, Inches	Rope, Inches	Shell, Inches		Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each
1¾x ½x⅜	⅜	3	¾	$0.70	$1.10	.....	$1.20	$1.60	.....
2 x ½x⅜	⅜	3½	1	.75	1.15	.....	1.25	1.65	.....
2¼x ⅝x⅜	½	4	1½	.85	1.20	$1.50	1.35	1.70	$2.00
3 x ¾x⅜	⅝	5	2½	.90	1.25	1.75	1.40	1.75	2.25
3½x1 x½	¾	6	4¼	1.10	1.50	2.20	1.60	2.00	2.70
4¼x1 x½	⅞	7	6	1.30	1.70	2.50	1.80	2.20	3.00
4¾x1⅛x⅝	1	8	9	1.65	2.25	3.25	2.25	2.85	3.85
5½x1⅛x⅝	1	9	12	1.85	2.50	3.70	2.60	3.25	4.45
6¼x1¼x⅝	1⅛	10	15½	2.75	3.50	4.75	3.65	4.40	5.65
7¼x1¼x¾	1⅛	11	19	4.45	5.30	6.75	5.65	6.50	7.95
8 x1⅜x¾	1¼	12	24	4.45	5.30	6.75	5.65	6.50	7.95
9 x1½x¾	1¼	13	30	7.00	8.15	9.75	9.50	10.65	12.25
9½x1⅝x⅞	1⅜	14	38	7.00	8.15	9.75	9.50	10.65	12.25
10 x1⅝x⅞	1½	15	40	8.00	9.25	11.00	11.00	12.25	14.00
11 x1¾x⅞	1⅝	16	54	10.00	11.50	14.00	13.50	15.00	17.50

DOUBLE SHEAVES

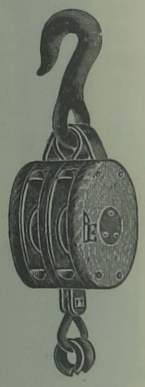


Fig. 2568

Dimensions			Weight Each, Lbs.	With Loose Side Hooks			With Loose Swivel Hooks		
Sheaves, Inches	Rope, Inches	Shell, Inches		Iron Bushed, Each	Rolled Bushed, Each	Phosphor Bronze, Each	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze, Each
1¾x ½x⅜	⅜	3	1½	$1.30	$2.00	.....	$1.80	$2.50	.....
2 x ½x⅜	⅜	3½	1¾	1.45	2.20	.....	1.95	2.70	.....
2¼x ⅝x⅜	½	4	2¼	1.60	2.25	$2.90	2.10	2.75	$3.40
3 x ¾x⅜	⅝	5	4¼	1.75	2.35	3.35	2.25	2.85	3.85
3½x1 x½	¾	6	7	2.00	2.85	4.00	2.50	3.35	4.50
4¼x1 x½	⅞	7	8½	2.40	3.35	4.50	3.00	3.95	5.10
4¾x1⅛x⅝	1	8	13	2.85	4.15	5.70	3.60	4.90	6.45
5½x1⅛x⅝	1	9	17	3.40	4.70	6.75	4.30	5.60	7.65
6¼x1¼x⅝	1⅛	10	23½	4.50	6.00	8.50	5.70	7.20	9.70
7¼x1¼x¾	1⅛	11	26	7.50	9.20	12.50	9.25	10.95	14.25
8 x1⅜x¾	1¼	12	36	7.50	9.20	12.50	9.25	10.95	14.25
9 x1½x¾	1¼	13	43	10.50	12.80	17.00	13.50	15.80	20.00
9½x1⅝x⅞	1⅜	14	58	10.50	12.80	17.00	13.50	15.80	20.00
10 x1⅝x⅞	1½	15	62	13.00	15.50	19.50	16.50	19.00	23.00
11 x1¾x⅞	1⅝	16	77	15.00	18.00	24.00	21.00	24.00	30.00

TRIPLE SHEAVES

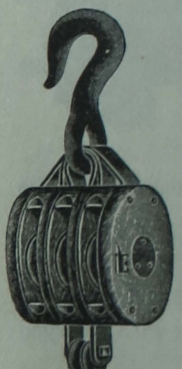


Fig. 2569

Dimensions			Weight Each, Lbs.	With Loose Side Hooks			With Loose Swivel Hooks		
Sheaves, Inches	Rope, Inches	Shell, Inches		Iron Bushed, Each	Rolled Bushed, Each	Phosphor Bronze Bushed, Each	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze, Each
1¾x ½x⅜	⅜	3	2	$1.75	$2.90	.....	$2.25	$3.40	.....
2 x ½x⅜	⅜	3½	2⅜	2.00	3.15	.....	2.50	3.65	.....
2¼x ⅝x⅜	½	4	3½	2.15	3.25	$4.15	2.65	3.75	$4.65
3 x ¾x⅜	⅝	5	6	2.25	3.50	4.75	2.75	4.00	5.25
3½x1 x½	¾	6	10½	2.90	4.40	5.80	3.50	5.00	6.40
4¼x1 x½	⅞	7	13½	3.50	5.00	6.70	4.25	5.75	7.45
4¾x1⅛x⅝	1	8	19	4.25	6.00	8.50	5.15	6.90	9.40
5½x1⅛x⅝	1	9	25	4.75	7.25	10.00	5.95	8.45	11.20
6¼x1¼x⅝	1⅛	10	33	6.25	8.50	12.50	8.00	10.25	14.25
7¼x1¼x¾	1⅛	11	40	10.65	13.20	18.50	13.15	15.70	21.00
8 x1⅜x¾	1¼	12	48	10.65	13.20	18.50	13.15	15.70	21.00
9 x1½x¾	1¼	13	60	15.00	18.45	25.00	18.50	21.95	28.50
9½x1⅝x⅞	1⅜	14	80	15.00	18.45	25.00	18.50	21.95	28.50
10 x1⅝x⅞	1½	15	87	18.00	21.75	28.50	22.50	26.25	33.00
11 x1¾x⅞	1⅝	16	115	22.00	26.50	34.00	30.00	34.50	42.00

Beckets furnished on all single, one-half double, one-third triple blocks without extra charge. See following page for prices for additional beckets.

WOOD TACKLE BLOCKS

HEAVY THICK MORTISE

Adapted for railroads, mining, bridge building and contractors' work. Will be furnished with either heavy loose side hooks, heavy loose swivel hooks or heavy shackles at the list prices given below.

SINGLE SHEAVES

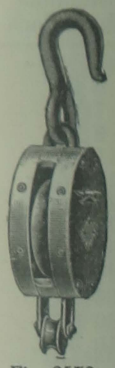


Fig. 2570

With Loose Side Hook

Dimensions			Wgt. Each, Lbs.	With Heavy Loose Side Hooks and Straps			With Heavy Shackles and Straps			With Heavy Loose Swivel Hooks and Straps		
Size Sheave, Inches	For Dia. Rope, Ins.	Length Shell, Ins.		Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each
3½x1 x½	¾	6	5	$2.00	$2.75	$4.00	....	....	....	....	....	....
4 x1⅛x½	1	7	8	2.25	3.00	4.25	$2.25	$3.00	$4.25	$2.85	$3.60	$5.10
4¾x1⅜x⅝	1⅛	8	12	2.75	3.50	5.00	2.75	3.50	5.00	3.50	4.25	5.75
5½x1⅜x⅝	1⅛	9	17	3.15	4.00	5.75	3.15	4.00	5.75	4.05	4.90	6.65
6¼x1½x¾	1¼	10	21	4.00	5.25	7.25	4.00	5.25	7.25	5.20	6.45	8.45
7 x1½x¾	1¼	11	26	5.25	6.50	9.25	5.25	6.50	9.25	7.75	9.00	11.75
8 x1⅝x¾	1½	12	32	5.25	6.50	9.25	5.25	6.50	9.25	7.75	9.00	11.75
9 x1¾x¾	1½	13	42	8.00	9.75	13.00	8.00	9.75	13.00	11.25	13.00	16.25
9½x1⅞x⅞	1¾	14	51	8.00	9.75	13.00	8.00	9.75	13.00	11.25	13.00	16.25
10 x1⅞x⅞	1¾	15	55	9.00	11.00	15.00	9.00	11.00	15.00	12.50	14.50	18.50
11 x2¼x1	2	16	67	11.50	14.00	18.00	11.50	14.00	18.00	16.00	18.50	22.50

DOUBLE SHEAVES

Dimensions			Wgt. Each, Lbs.	With Heavy Loose Side Hooks and Straps			With Extra Heavy Shackles and Straps			With Heavy Loose Swivel Hooks and Straps		
Size Sheave, Inches	For Dia. Rope, Ins.	Length Shell, Ins.		Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each
3½x1 x½	¾	6	8	$3.50	$5.00	$7.00	....	....	....	....	....	....
4 x1⅛x½	1	7	13	4.00	5.50	7.50	$4.00	$5.50	$7.50	$4.75	$6.25	$8.75
4¾x1⅜x⅝	1⅛	8	19	4.50	6.00	9.00	4.50	6.00	9.00	5.40	6.90	9.90
5½x1⅜x⅝	1⅛	9	25	5.25	6.95	10.50	5.25	6.95	10.50	6.45	8.15	11.70
6¼x1½x¾	1¼	10	31	6.50	9.00	13.50	6.50	9.00	13.50	8.25	10.75	15.25
7 x1½x¾	1¼	11	38	8.50	11.00	17.00	8.50	11.00	17.00	11.50	14.00	20.00
8 x1⅝x¾	1½	12	45	8.50	11.00	17.00	8.50	11.00	17.00	11.50	14.00	20.00
9 x1¾x¾	1½	13	62	13.00	16.50	23.50	13.00	16.50	23.50	16.50	20.00	27.00
9½x1⅞x⅞	1¾	14	73	13.00	16.50	23.50	13.00	16.50	23.50	16.50	20.00	27.00
10 x1⅞x⅞	1¾	15	80	15.00	19.00	26.50	15.00	19.00	26.50	19.50	23.50	31.00
11 x2¼x2	2	16	110	18.00	23.00	32.00	18.00	23.00	32.00	24.00	29.00	38.00

Fig. 2571

With Loose Swivel Hook

TRIPLE SHEAVES

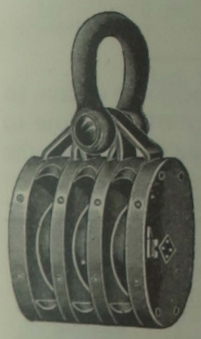


Fig. 2572

With Shackle

Dimensions			Wt. Each, Lbs.	With Heavy Loose Side Hooks and Straps			With Extra Heavy Shackles and Straps			With Heavy Loose Swivel Hooks and Straps		
Size Sheave, Ins.	For Dia. Rope, Ins.	Length Shell, Ins.		Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each	Iron Bush Each	Roller Bush Each	Phosphor Bronze Bush Each
3½x1 x½	¾	6	11	$5.00	$7.25	$9.00	....	....	....	....	....	....
4 x1⅛x½	1	7	17	5.50	7.75	10.00	$5.50	$7.75	$10.00	$6.40	$8.65	$12.40
4¾x1⅜x⅝	1⅛	8	26	6.30	8.55	13.00	6.30	8.55	13.00	7.50	9.75	14.20
5½x1⅜x⅝	1⅛	9	35	7.25	9.80	15.00	7.25	9.80	15.00	9.00	11.55	16.75
6¼x1½x¾	1¼	10	43	8.50	12.25	19.00	8.50	12.25	19.00	11.00	14.75	21.50
7 x1½x¾	1¼	11	52	12.50	16.25	25.00	12.50	16.25	25.00	15.75	19.50	28.25
8 x1⅝x¾	1½	12	62	12.50	16.25	25.00	12.50	16.25	25.00	15.75	19.50	28.25
9 x1¾x¾	1½	13	82	17.00	22.25	33.00	17.00	22.25	33.00	21.50	26.75	37.50
9½x1⅞x⅞	1¾	14	97	17.00	22.25	33.00	17.00	22.25	33.00	21.50	26.75	37.50
10 x1⅞x⅞	1¾	15	112	20.00	26.00	37.00	20.00	26.00	37.00	26.00	32.00	43.00
11 x2¼x1	2	16	150	28.00	35.50	48.00	28.00	35.50	48.00	36.00	43.50	56.00

BECKETS

Beckets are furnished in all single, one-half double and one-third of the triple blocks without charge. If a greater proportion is wanted, add for each additional becket, net extra, as follows:

Size Block, Inches	3 to 5	6	7	8	9	10	12	14	15	16
Net Extra, Each Block	$0.05	.06	.07	.08	.09	.10	.12	.14	.15	.16

SNATCH BLOCKS

VARNISHED HARDWOOD SHELL—FOR FIBRE ROPE

Japanned cast iron single sheave; japanned wrought iron head, straps and hook; steel pin.

Fig. 2573
Drop Link

Fig. 2574
Self-Locking

Length Shell, Inches	Size Sheave, Inches	For Diameter Rope, Inches	Weight Each, Lbs.	Iron Bushed, Each	Improved Roller Bushed, Each	Phosphor Bronze or Metaline Bushed, Each
6	3 x1 1/8x 1/2	7/8	6	$4.00	$4.65	$5.25
7	3 1/2x1 1/4x 1/2	7/8	8 1/2	4.75	5.50	6.00
8	4 1/2x1 3/8x 5/8	1	12	5.75	6.60	7.25
9	5 x1 3/8x 5/8	1 1/8	14	6.75	7.75	8.50
10	5 3/4x1 7/8x 3/4	1 1/4	22	8.50	10.00	11.00
12	6 3/4x2 1/8x 3/4	1 1/2	31	10.00	11.50	13.00
14	8 x2 1/4x 7/8	1 3/4	44	13.00	15.00	16.50
16	9 x2 5/8x1	2	63	17.00	20.00	22.00
18	10 x3 x1 1/8	2 1/4	89	25.00	28.50	31.00
20	11 x3 1/2x1 1/4	2 1/2	128	38.00	43.00	46.00
22	11 3/4x4 1/4x1 1/2	3	170	55.00	63.00	68.00
24	12 1/2x4 1/2x1 1/2	3 1/2	205	70.00	78.00	86.00
26	14 x4 3/4x1 3/4	4	295	90.00	....	110.00

STEEL SHELL—FOR FIBRE ROPE

Japanned shell with rounded edges. Japanned cast iron single sheave; wrought iron head, straps and hook; steel pin.

Length Shell, Inches	Size Sheave, Inches	For Diameter Rope, Inches	Weight Each, Lbs.	Iron Bushed, Each	Improved Roller Bushed, Each	Phosphor Bronze or Metaline Bushed, Each
6	3 x1 1/8x 1/2	7/8	6 1/2	$4.00	$4.65	$5.25
7	3 1/2x1 1/4x 1/2	7/8	9	4.75	5.50	6.00
8	4 1/2x1 3/8x 5/8	1	13	5.75	6.60	7.25
9	5 x1 3/8x 5/8	1 1/8	18	6.75	7.75	8.50
10	5 3/4x1 7/8x 3/4	1 1/4	28	8.50	10.00	11.00
12	6 3/4x2 1/8x 3/4	1 1/2	36	10.00	11.50	13.00
14	8 x2 1/4x 7/8	1 3/4	48	13.00	15.00	16.50
16	9 x2 5/8x1	2	75	17.00	20.00	22.00
18	10 x3 x1 1/8	2 1/4	....	25.00	28.50	31.00
20	11 x3 1/2x1 1/4	2 1/2	....	38.00	43.00	46.00
22	11 3/4x4 1/4x1 1/2	3	....	55.00	63.00	68.00
24	12 1/2x4 1/2x1 1/2	3 1/2	....	70.00	78.00	86.00
26	14 x4 3/4x1 3/4	4	....	90.00	....	110.00

Fig. 2575
Drop Link

Fig. 2576
Self-Locking

Note.—Blocks will be furnished in either of the styles shown at the same list prices.

WROUGHT IRON—FOR WIRE ROPE

Shell, straps and head are of wrought iron. Drop link pattern has semi-circular guard pressed in shell over sheave to prevent wire from slipping between shell and sheave; self-locking patterns have center extension piece coming close to the sheave, preventing the wire rope from leaving the sheave and also preventing the shell from binding or pinching the sheave.

Fig. 2577
Drop Link

Fig. 2578
Self-Locking

Fig. 2579
Bail

Fig. 2580
Self-Locking Clasp with Eye

Diameter Sheave, Inches	For Diameter Rope, Inches	Weight Each, Lbs.	Iron Bushed, Each	Phosphor Bronze Bushed, Each
6	3/8	15	$11.00	$12.00
8	1/2	25	14.00	15.00
10	5/8	40	16.00	18.00
12	5/8	55	18.00	21.00
14	3/4	80	20.00	24.00
16	7/8	110	28.00	33.00
18	1	160	38.00	44.00
20	1 1/4	234	50.00	58.00
20	1 1/2	252	70.00	78.00

Note.—Lists apply to any style illustrated.

STEEL TACKLE BLOCKS

High grade steel shells and pins; forged hooks and straps; japanned cast iron sheaves; straps extend to bottom of shell and support the rope thimble; with or without beckets; with loose side hooks.

SINGLE SHEAVES

Length Shell, Inches	For Rope, Inches	Sheaves, Inches	Weight Each, Lbs.
3	3/8	1 3/4 x 1/2 x 3/8	5/8
4	1/2	2 1/4 x 5/8 x 3/8	1
5	5/8	3 x 3/4 x 3/8	2
6	3/4	3 1/2 x 1 x 1/2	3 1/2
7	7/8	4 1/4 x 1 x 1/2	4 3/4
8	1	4 3/4 x 1 1/8 x 5/8	7 1/4
9	1	5 1/2 x 1 1/8 x 5/8	9 1/4
10	1 1/8	6 1/4 x 1 1/4 x 5/8	12 3/4

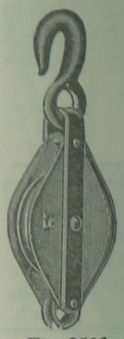


Fig. 2581

Length Shell, Inches	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each
3	$0.70	$1.10	....
4	.85	1.20	$1.50
5	.90	1.25	1.75
6	1.10	1.50	2.20
7	1.30	1.70	2.50
8	1.65	2.25	3.25
9	1.85	2.50	3.70
10	2.75	3.50	4.75

DOUBLE SHEAVES

Lgth. Shell, Inches	Sheaves, Inches	For Rope, Inches	Weight Each, Lbs.
3	1 3/4 x 1/2 x 3/8	3/8	1
4	2 1/4 x 5/8 x 3/8	1/2	1 3/4
5	3 x 3/4 x 3/8	5/8	3
6	3 1/2 x 1 x 1/2	3/4	5
7	4 1/4 x 1 x 1/2	7/8	7 1/4
8	4 3/4 x 1 1/8 x 5/8	1	10 3/4
9	5 1/2 x 1 1/8 x 5/8	1	14
10	6 1/4 x 1 1/4 x 5/8	1 1/8	19

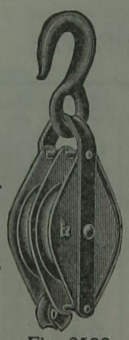


Fig. 2582

Length Shell, Inches	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each
3	$1.30	$2.00	....
4	1.60	2.25	$2.90
5	1.75	2.35	3.35
6	2.00	2.85	4.00
7	2.40	3.35	4.50
8	2.85	4.15	5.70
9	3.40	4.70	6.75
10	4.50	6.00	8.50

TRIPLE SHEAVES

Lgth. Shell, Inches	Sheaves, Inches	For Rope Inches	Weight Each, Lbs.
3	1 3/4 x 1/2 x 3/8	3/8	1 1/4
4	2 1/4 x 5/8 x 3/8	1/2	2 1/4
5	3 x 3/4 x 3/8	5/8	3 3/4
6	3 1/2 x 1 x 1/2	3/4	6 1/2
7	4 1/4 x 1 x 1/2	7/8	10
8	5 1/2 x 1 1/8 x 5/8	1	15
9	6 1/4 x 1 1/4 x 5/8	1	19
10	4 3/4 x 1 1/8 x 5/8	1 1/8	26

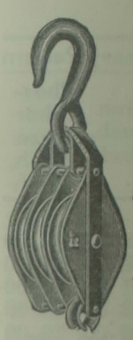


Fig. 2583

Length Shell, Inches	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each
3	$1.75	$2.90	....
4	2.15	3.25	$4.15
5	2.25	3.50	4.75
6	2.90	4.40	5.80
7	3.50	5.00	6.70
8	4.25	6.00	8.50
9	4.75	7.25	10.00
10	6.25	8.50	12.50

STEEL TACKLE BLOCKS

IMPROVED

Designed to withstand rough usage. Steel shell heavily reinforced with forged steel straps; the outside strap is of one piece and extends to the bottom of the shell supporting the becket or rope thimble. Rounded edges on the shell prevent wear on the rope. Blocks are nicely japanned. Heavy loose side hooks are forged steel.

SINGLE AND DOUBLE SHEAVES

Length Shell, Inches	Sheaves, Inches	For Rope, Ins.	Wgt. Single Each, Lbs.	Wgt. Dble. Each, Lbs.
4	2 1/4 x 5/8 x 3/8	1/2	1 1/4	1 3/4
5	3 x 3/4 x 3/8	5/8	2 1/4	3 1/2
6	3 1/2 x 1 x 1/2	3/4	4 1/4	6 3/4
7	4 1/4 x 1 x 1/2	7/8	6	9
8	4 3/4 x 1 1/8 x 5/8	1	8 1/2	13
9	5 1/2 x 1 3/8 x 5/8	1 1/8	11 1/2	18
10	6 1/4 x 1 1/2 x 3/4	1 1/4	16	25
12	8 x 1 7/8 x 3/4	1 1/2	26	38
14	9 1/2 x 1 7/8 x 7/8	1 3/4	42	71
16	11 x 2 1/4 x 1	2	71	110
18	12 x 2 5/8 x 1 1/8	2 1/4	....	..
20	13 1/2 x 2 7/8 x 1 1/4	2 1/2	148	214

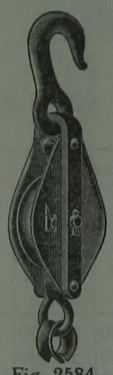


Fig. 2584

Length Shell, Ins.	Single Sheaves: Iron Bushed, Each	Single Sheaves: Roller Bushed, Each	Single Sheaves: Phosphor Bronze, Bushed Each	Double Sheaves: Iron Bushed, Each	Double Sheaves: Roller Bushed, Each	Double Sheaves: Phosphor Bronze, Bushed Each
4	$0.90	$1.40	$1.65	$1.75	$2.60	$3.25
5	1.00	1.50	1.80	1.90	2.90	3.50
6	1.25	1.75	2.10	2.25	3.25	4.00
7	1.50	2.10	2.45	2.70	3.85	4.60
8	1.85	2.55	2.90	3.20	4.60	5.30
9	2.40	3.20	3.55	4.00	5.60	6.30
10	3.10	4.05	4.40	5.10	7.00	7.70
12	5.00	6.00	6.45	8.25	10.35	11.15
14	7.50	8.75	9.10	11.75	14.25	15.00
16	13.00	14.00	15.00	21.00	24.00	25.00
18	22.00	....	25.00	35.00	.....	41.00
20	30.00	....	34.00	50.00	.....	58.00

TRIPLE SHEAVES

Length Shell, Inches	Sheave, Inches	For Rope, Inches
4	2 1/4 x 5/8 x 3/8	1/2
5	3 x 3/4 x 3/8	5/8
6	3 1/2 x 1 x 1/2	3/4
7	4 1/4 x 1 x 1/2	7/8
8	4 3/4 x 1 1/8 x 5/8	1
9	5 1/2 x 1 3/8 x 5/8	1 1/8
10	6 1/4 x 1 1/2 x 3/4	1 1/4
12	8 x 1 5/8 x 3/4	1 1/2
14	9 1/2 x 1 7/8 x 7/8	1 3/4
16	11 x 2 1/4 x 1	2
18	12 x 2 5/8 x 1 1/8	2 1/4
20	13 x 1/2 2 7/8 x 1 1/4	2 1/2

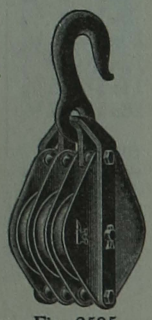


Fig. 2585

Length Shell, Inches	Weight Each, Lbs.	Iron Bushed, Each	Roller Bushed, Each	Phosphor Bronze Bushed, Each
4	2 1/2	$2.50	$3.75	$4.75
5	5	2.75	4.25	5.15
6	9	3.25	4.75	5.80
7	12 1/2	4.00	5.80	6.85
9	17 1/2	4.75	6.85	7.90
9	25	5.50	7.90	9.00
10	33	7.00	9.85	11.00
12	53	11.75	14.90	16.00
14	85	16.50	20.25	21.30
16	140	32.00	35.00	38.00
18	223	50.00	.....	59.00
20	276	65.00	.....	77.00

WROUGHT IRON BLOCKS

FOR WIRE ROPE

With steel braces or bolts; cast iron japanned sheaves and supplementary rollers at middle corners, wrought iron straps, connections and beckets. Fitted with stiff swivel hooks, loose side hooks or shackles as preferred. Diamond shell. The center straps in double and triple blocks extend full length of shell, furnishing proper support for center pin in middle of the block.

SINGLE SHEAVES

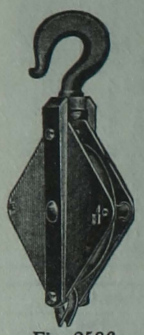


Fig. 2586

Size Sheave, Ins.	Regular Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Size Sheave, Ins.	Heavy Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Extra Heavy Pattern: Wgt. Each, Lbs.	Iron Bush Each	Phosphor Brze. Bush, Each
6x1 x 3/4	3/8	14	$6.00	$9.00	6x1 3/4	1/2	15	$9.00	$12.00	....	....	....
8x1 1/4x 3/4	1/2	20	8.00	11.00	8x1 1/4x 7/8	1/2	25	11.00	14.00	31	$11.00	$14.00
10x1 1/4x 7/8	5/8	36	10.00	13.00	10z1 1/4x1	5/8	42	14.00	17.00	44	14.00	17.00
12x1 1/2x1	5/8	55	12.00	15.00	12x1 1/2x1 1/8	3/4	67	16.00	19.00	69	16.00	19.00
14x1 1/2x1 1/8	3/4	71	14.00	17.00	14x1 1/2z1 1/4	3/4	88	18.00	21.00	93	18.00	21.00
16x1 3/4x1 1/4	7/8	97	21.50	25.00	16x1 3/4x1 1/2	7/8	132	31.00	36.00	135	31.00	36.00
.....	..	..	....	....	18x1 3/4x1 1/2	1	180	34.50	40.00	195	34.50	40.00
.....	..	..	....	....	*20x1 7/8x1 1/2	1	..	....	....	...	43.00	49.00

DOUBLE SHEAVES

Fig. 2587

Size Sheave, Ins.	Regular Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Size Sheave, Ins.	Heavy Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Extra Heavy Pattern: Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each
6x1 x 3/4	3/8	21	$11.00	$17.00	6x1 x 3/4	1/2	22	$14.00	$20.00	....	....	....
8x1 1/4x 3/4	1/2	30	13.00	19.00	8x1 1/4x 7/8	1/2	39	16.00	22.00	45	$16.00	$22.00
10x1 1/4x 1/8	5/8	50	15.00	21.00	10x1 1/4x1	5/8	66	20.00	26.00	70	20.00	26.00
12x1 1/2x1	5/8	80	17.00	23.00	12x1 1/2x1 1/8	3/4	101	23.00	29.00	115	23.00	29.00
14x1 1/2x1 7/8	3/4	113	19.00	25.00	14x1 1/2x1 1/4	3/4	140	25.00	31.00	150	25.00	31.00
16x1 3/4x1 1/4	7/8	158	31.00	38.00	16x1 3/4x1 1/2	7/8	225	40.00	50.00	240	40.00	50.00
.....	..	..	....	....	18x1 3/4x1 1/2	1	300	45.00	56.00	320	45.00	56.00
.....	..	..	....	....	*20x1 7/8x1 1/2	1	..	....	...	....	60.00	72.00

TRIPLE SHEAVES

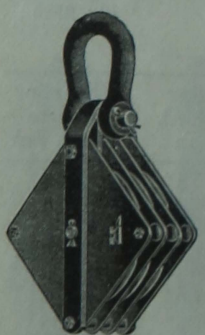


Fig. 2588

Size Sheave, Ins.	Regular Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Size Sheave, Ins.	Heavy Pattern: For Dia. Rope, Ins.	Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each	Extra Heavy Pattern: Wgt. Each, Lbs.	Iron Bush, Each	Phosphor Brze. Bush, Each
6x x 3/4	3/8	27	$14.00	$22.00	6x1 x 3/4	1/2	30	$20.00	$28.00	...	....	....
8x1 1/4x 3/4	1/2	42	16.00	24.00	8x1 1/4x 7/8	1/2	52	22.50	32.00	67	$22.50	$32.00
10x1 1/4x 7/8	5/8	76	20.00	28.00	10x1 1/4x1	5/8	88	28.00	37.00	95	28.00	37.00
12x1 1/2x1	5/8	112	23.00	31.00	12x1 1/2x1 1/8	3/4	136	31.00	41.00	166	31.00	41.00
14x1 1/2x1 1/8	3/4	146	26.00	34.00	14x1 1/2x1 1/4	3/4	183	36.00	45.00	195	36.00	45.00
16x1 3/4x1 1/4	7/8	200	39.50	50.00	16x1 3/4x1 1/2	7/8	295	46.00	65.00	345	46.00	72.00
.....	..	...	....	....	18x1 3/4x1 1/2	1	..	60.00	75.00	460	60.00	78.00
.....	..	...	....	....	*20x1 7/8x1 1/2	1	..	....	....	...	72.00	90.00

*This size furnished in shackles only.

STEEL TACKLE BLOCKS

SURE GRIP

SINGLE REEVED

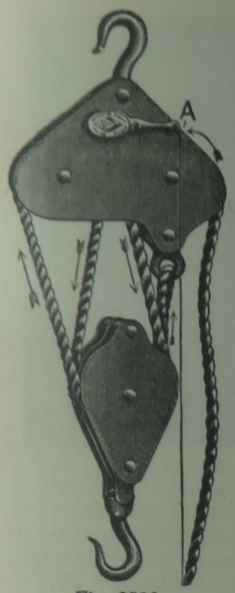


Fig. 2589

Will hold load at any point without backward slip, thus enabling a man to hoist with half the usual amount of exertion; the wedge shaped brake has a double grip and is absolutely automatic and very positive. Its efficiency increases in direct proportion to increase of load; at same time it is susceptible of being disengaged by very slight pressure. Continuous use has shown this block to be very economical in the wear of rope.

Bolted steel shells with cast iron sheaves and wrought iron swivel hooks; two sheaves at top and bottom. When properly reeved the two center ropes that pass the wedge brake travel in the same direction.

NOS.	3	4	5	6
For Rope Diameter, Inches	3/8	1/2	5/8	3/4
Capacity, Lbs.	600	1000	1800	2500
Weight Each, Lbs.	5	8	15	25
Each	$3.00	5.50	7.00	8.50

DOUBLE REEVED

Similar to single reeved blocks but are double reeved and have four sheaves in top and three sheaves in bottom.

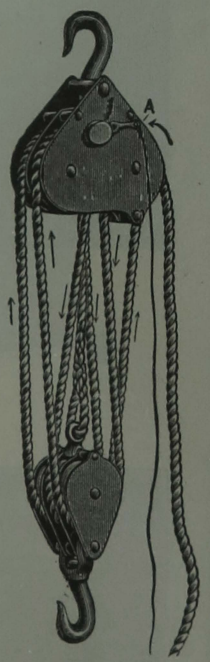


Fig. 2590

NOS.	4 1/2	5 1/2	6 1/2
For Rope Dia., Inches	1/2	5/8	3/4
Capacity, Lbs.	3000	3500	5000
Weight Each, Lbs.	15	25	50
Each	$10.00	12.00	14.00

Note.—Rope is not included with these blocks unless specially ordered and will be charged extra. In ordering with rope state distance between lowest starting point and the hook on upper hoist.

TACKLE BLOCKS

BOSTON

SELF-LOCKING AND REGULAR

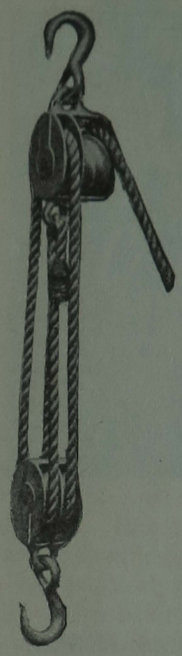


Fig. 2591

They are not only invaluable for piano moving, but for all other purposes for which blocks can be used, as they hold the strain or load as fast as one can pull the rope.

In the larger sizes, these blocks are used in place of chain hoists for light loads, as the load may be instantly held at any desired point by means of the self-locking device. They are invaluable in machine shops, factories, mills, warehouses, freight-houses, hay and grain stores, city departments, and for piano movers, painters, hoisting ashes, and all places where a tackle block can be used.

Made of malleable iron, heavily galvanized, with steel hooks. Sheaves are fitted with patent long steel anti-friction roller bearings; short and easy running blocks. Simple in construction, durable, will not chafe the rope, and save half the labor required by other non-holding blocks.

To lock or hold the load or strain at any point it is only necessary to stand to right of blocks and haul on the ropes, then ease up the fall and allow the rope to run on the spiral sheave into the lock, as illustrated.

To lower: first hoist load slightly to bring load or hauling rope back into running groove of locking sheave, hold load and stand slightly to left of blocks.

NOS.	Length Block, Inches	Size of Sheave, Inches	Diam. Rope, Inches	Capacity, Lbs.	Weight Each, Lbs.	Per Set, Each
Double and Single Blocks						
24 1/2	3	1 3/4 x 1/2 x 5/16	3/8	600	3	$3.10
25	4	2 1/4 x 5/8 x 3/8	1/2	1000	5 1/4	3.45
26	5	3 x 3/4 x 3/8	5/8	1200	9 1/2	3.60
27	6	3 1/2 x 1 x 1/2	3/4	1700	15	4.35
28	7	4 1/4 x 1 x 1/2	7/8	2000	22 3/4	5.05
29	8	4 3/4 x 1 1/8 x 5/8	1	2500	28	6.40
Double and Double Blocks						
30 1/2	3	1 3/4 x 1/2 x 5/16	3/8	700	3 1/4	4.00
31	4	2 1/4 x 5/8 x 3/8	1/2	1200	7	4.50
32	5	3 x 3/4 x 3/8	5/8	1700	10 3/4	4.70
33	6	3 1/2 x 1 x 1/2	3/4	2000	18 1/4	5.70
34	7	4 1/4 x 1 x 1/2	7/8	2500	26 1/4	6.70
35	8	4 3/4 x 1 1/8 x 5/8	1	3000	30	8.30
Triple and Double Blocks						
36 1/2	3	1 3/4 x 1/2 x 5/16	3/8	1200	4	4.75
37	4	2 1/4 x 5/8 x 3/8	1/2	1750	7	5.50
38	5	3 x 3/4 x 3/8	5/8	2000	12 1/4	5.85
39	6	3 1/2 x 1 x 1/2	3/4	2500	22	7.25
40	7	4 1/4 x 1 x 1/2	7/8	3000	35	8.35
41	8	4 3/4 x 1 1/8 x 5/8	1	3500	40	10.15
Triple and Triple Blocks						
42 1/2	3	1 3/4 x 1/2 x 5/16	3/8	1400	4 1/2	4.90
43	4	2 1/4 x 5/8 x 3/8	1/2	1800	8 1/4	6.50
44	5	3 x 3/4 x 3/8	5/8	2500	14 1/4	7.00
45	6	3 1/2 x 1 x 1/2	3/4	3000	25 1/4	8.80
46	7	4 1/4 x 1 x 1/2	7/8	4000	34 3/4	10.00
47	8	4 3/4 x 1 1/8 x 5/8	1	5000	44	12.00

Note.—No rope is included with these blocks unless specially ordered and will be charged extra.

OVERHEAD CONVEYING EQUIPMENT

LOUDEN'S

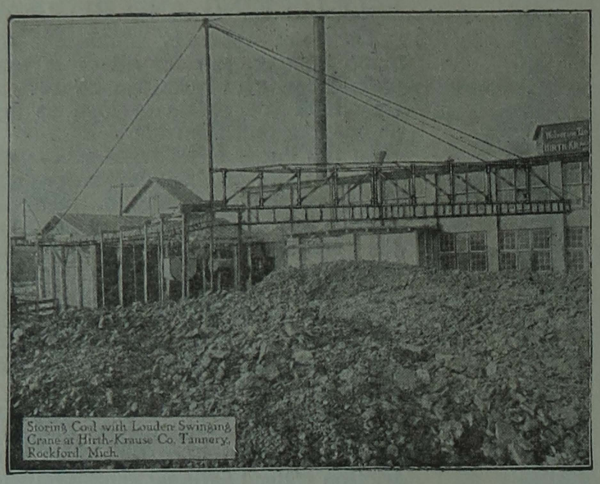


Fig. 2592

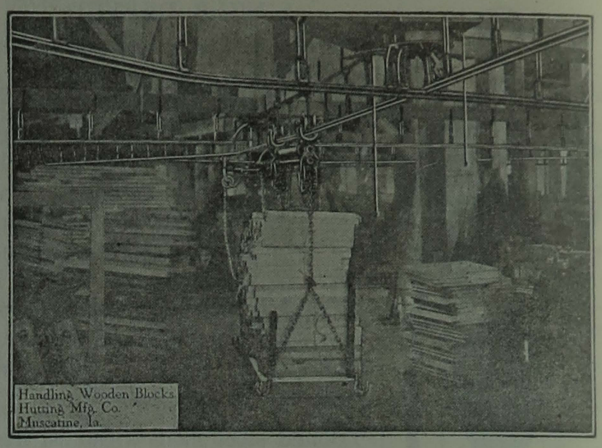


Fig. 2593

SOLVES CONVEYING PROBLEMS PERMANENTLY AT MODERATE COST

Lost time eats up profit. Labor cost is the biggest item in production expense, whether you have a small or large plant, whether you are operating a factory, foundry, warehouse, machine shop, garage, or are engaged in any other work which requires lifting and carrying material.

Louden overhead carrying systems are revolutionizing the conveying methods in thousands of plants, both large and small, because it is something different from the ordinary system. It meets every condition, every requirement—takes the place of the heavy, cumbersome and costly I-beam and traveling crane—does away with wheelbarrows, trucking and other slow, laborious, time-wasting contrivances.

This system increases every minute's production possibilities—every employee's working capacity. Begins paying profits the day it is installed.

Its system of tracks, turntables, switches, and roller bearing carriers go anywhere. Tracks curve in and out of corners, over and around machinery, go from floor to floor, from room to room, from one building to another—always responds easily and accurately to operator's will—places its load exactly where wanted.

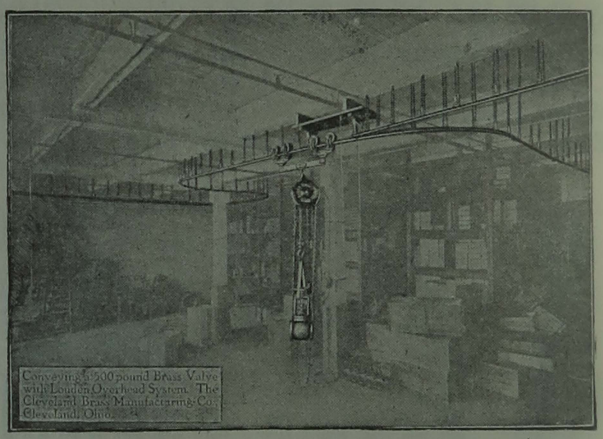


Fig. 2594

HAS DISTINCTIVE ADVANTAGES

It requires fewer men to do the same work. It relieves congestion on the floor. It eliminates the chances for accidents among workmen. It speeds up the work and increases production. It establishes a better co-operation between helpers and producing forces than any other system because it comes and goes quickly and always places its load exactly where it is wanted. And the comparatively low cost means that it can be adapted for use in any kind of business where any kind of material is handled.

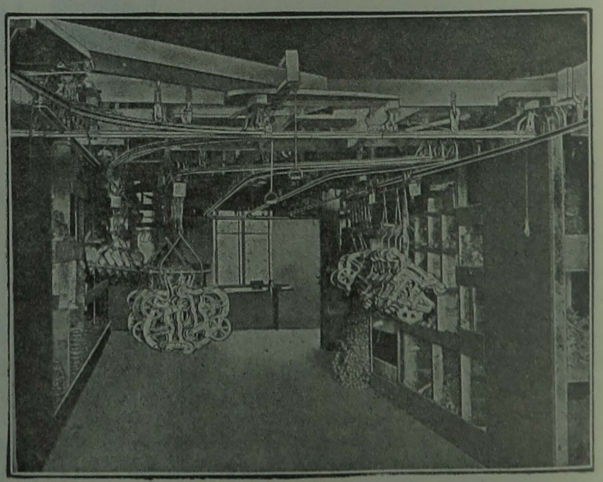


Fig. 2595

OVERHEAD CARRIERS

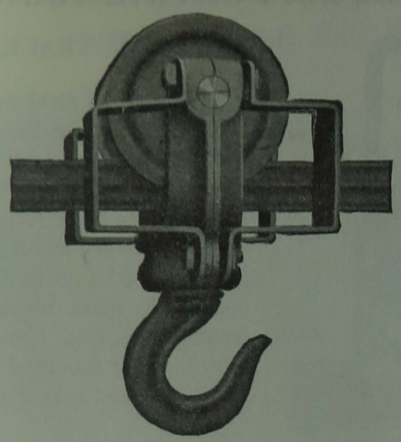


Fig. 2596

TWO WHEEL

The easiest running trolley for carrying light loads up to 250 pounds. No better arrangement or quicker method can be devised for such work as handling meat in a packing house or a cold storage plant. It is a wonderful labor and time saver, and in addition is an inexpensive installation.

This two-wheel trolley can be used to exceptionally good advantage in rubber tire plants. If it is preferable to have the operator follow the material along through different departments rather than to give each load a shove and let it glide along to the next destination.

SPECIFICATIONS

Capacity 250 pounds, wheels roller bearing, bumper plates 1 inch wide and 12 gauge material.

Each

NO. 1322—Weight Each, 10½ Lbs..... $4.50

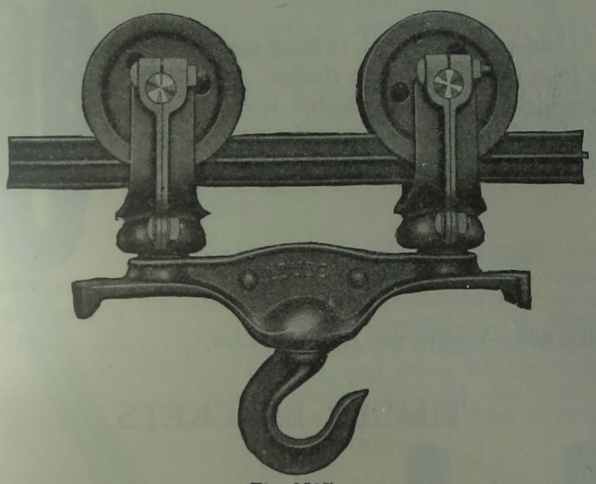


Fig. 2597

FOUR WHEEL

This carrier is especially suitable for use in factories for changing dies on machinery, hoisting and carrying material from one department to another. It is also intensely practical for lifting work in garages—being just the outfit for hoisting the engine out of its seat or raising the entire end of the car while work is being done underneath.

The carrier is fitted with large roller bearing track wheels made out of the highest grade malleable iron and heavy swivel truck castings, which make it easy to operate on the track and insure ample strength.

For loads up to 500 pounds we recommend this carrier, as it is built for long life and ease of operation. Any style of chain hoist can be used with the Louden Carrier.

Each

NO. 888—Weight Each, 22 Lbs..... $10.00

OVERHEAD CARRIERS

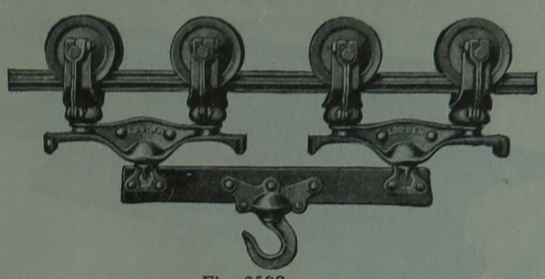


Fig. 2598

DOUBLE TRUCK

This is an exceptionally strong, serviceable carrier. It is substantially built, with eight heavy roller bearing wheels mounted on swivel trucks connected together by a heavy steel bar. A swivel hook is mounted on the central portion of this bar, from which a hoist, or in some cases the load, is suspended. This hook is so placed that the weight of the load is hung from the center of the carrier and evenly distributed on each set of trucks over a distance of 27 inches of track. Bumpers on trucks prevent the trolleys of two carriers from jamming should they come in contact.

It is extremely well adapted for all classes of work. The eight roller bearing wheels, rightly placed with respect to proper distribution of the load on the track, insure easy, smooth operation, even under the maximum load. Capacity of this carrier is 1000 pounds. The everyday practical work it is being put to has proven beyond a doubt that for loads up to this weight this double-truck merchandise carrier is the most practical outfit ever designed for the work.

Each

NO. B—Weight Each, 51 Lbs..... $25.00

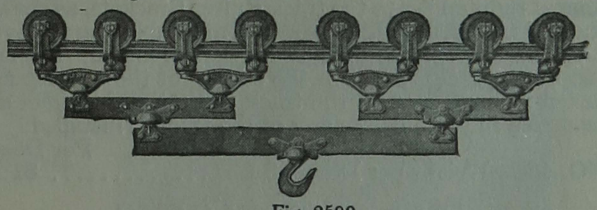


Fig. 2599

SIXTEEN WHEEL

For continuous operation of heavy loads weighing up to a ton, the sixteen-wheel carrier is the proper one to use. It is one of the smoothest running outfits ever designed to be manually operated. All sets of wheels are spaced equidistant, which distributes the entire weight of the load evenly on each of the sixteen trolleys over a distance of 63 inches of track. The tread of each individual wheel is machined down so as to make the smoothest possible traction surface as it turns on the rail; and each wheel has seventeen roller bearings which revolve around a stationary axle, so that the general construction of the wheel insures easy operation with the least degree of track friction. Trucks are provided with bumpers.

It takes all curves smoothly and easily. There is no binding or undue friction caused by the wheel flange rubbing on the track edge as it rounds the curve. The reason is—there are fourteen ball and socket swivel joints on this carrier, so that, regardless of any irregularity in the direction of the track, each set of trolleys adjusts itself instantly to conform to the curve. Capacity 2000 pounds.

Each

NO. 1326—Weight Each, 118 Lbs..... $50.00

TRACK

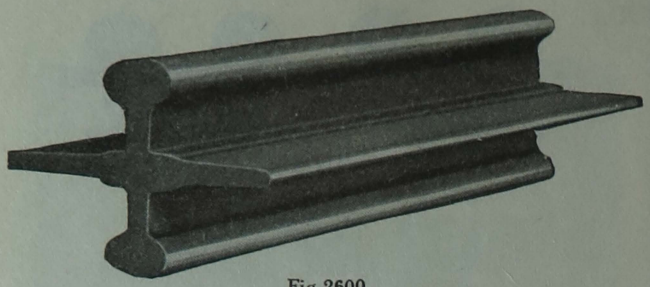


Fig 2600

Made of the finest and strongest high carbon steel. Shape of the track is such that all unnecessary friction is eliminated. This makes possible the movement of heavy loads with the least amount of power.

Besides being durable and strong, it can be curved to go in any irregular direction. If any changes or additions are desired when the system is installed, the track can easily be bent on the job to meet the requirements. This is not possible with enclosed or tubular tracks.

	Per 100 Feet
NO. 571—Weight per 100 Feet, 200 Lbs.	$30.00

RAFTER BRACKETS

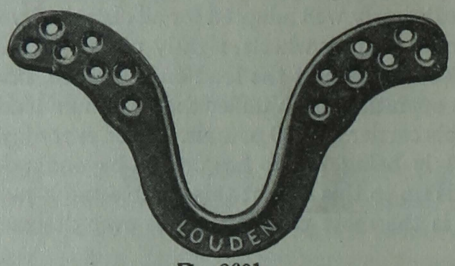


Fig. 2601

Where the track is supported from joists or beams running at right angles to the track Rafter Brackets, as shown, should be used. Made of the best malleable iron and is an exceptionally easy and handy bracket to install. The link supporting hangers rest in the stirrup of the bracket and fasten at any point on the track so that all brackets can be nailed in place before any of the track is installed.

	Per Dozen
NO. 424—Weight per Dozen, 3 Lbs.	$1.00

END STOP BLOCKS

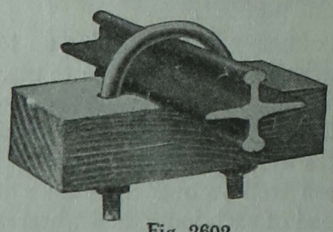


Fig. 2602

The end stop block is placed on the end of the track to prevent the carriers from running off. The block is fastened to the track by a U bolt and will not slip off.

	Each
NO. 523—Weight Each, 1 Lb.	$0.24

SPLICE CLAMP FOR TRACKS

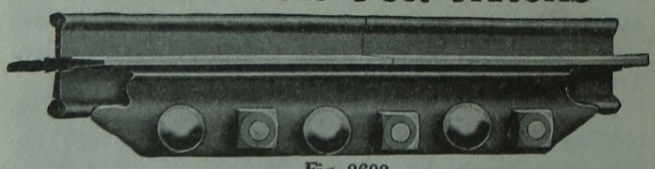


Fig. 2603

Made of malleable iron and is held firmly in place on the under side of the track by six bolts. It is easily attached, holds the flanges of the track level and makes it just as strong at the joint as at any other point.

Enough clamps are furnished for the track with every shipment.

	Each
NO. 550—Weight Each, 1⅛ Lbs.	$0.50

LINK SUPPORTING HANGERS

FOR TRACK

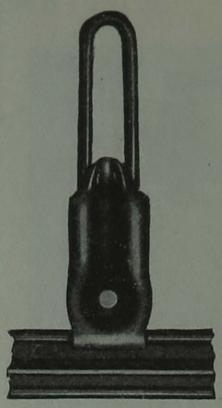


Fig. 2604

Links are of steel and the track grips are of the best malleable iron. An up and down adjustment of 2 inches can be made on these hangers so that they are convenient for use where joists are uneven. Furnished in odd lengths up to 61 inches, for use where track must pass under beams, pipe, etc. Hangers at least 5 inches long should always be used with overhead carriers.

Length, Inches	5	7	9	11	13
Weight per Dozen, Lbs.	9	9¾	11¼	12½	13½
Per Dozen	$2.75	2.95	3.15	3.35	3.55

Length, Inches	15	17	19	21	23
Weight per Dozen, Lbs.	14	15	16½	17	18
Per Dozen	$3.75	3.95	4.15	4.35	4.55

Length, Inches	25	27	29	31
Weight per Dozen, Lbs.	18¾	20½	21¼	21¾
Per Dozen	$4.75	4.95	5.15	5.35

Length, Inches	33	35	37
Weight per Dozen, Lbs.	23¼	23¾	25¼
Per Dozen	$5.55	5.75	5.95

RIDGE POLE BRACKETS

Used when the track is hung parallel to a joist or other 2-inch timber. Made of the highest grade malleable iron and so designed that it slips over the supporting timber and is nailed from both sides.

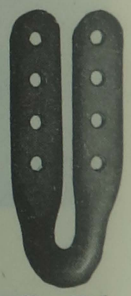


Fig. 2605

	Per Dozen
NO. 465—Weight per Dozen, 3 Lbs.	$1.50

TIMBER BRACKETS

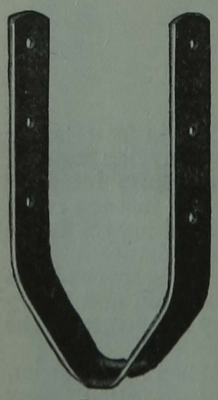


Fig. 2606

Heavy pressed steel; especially designed for supporting track from a 4-inch or 6-inch timber. The stirrup is so constructed that it perfectly fits the curve at the top of the link hanger. This insures a good fit with little or no play.

	Per Dozen
NO. 1308—4-Inch, Weight per Dozen, 6 Lbs.	$1.50
NO. 1309—6-Inch, Weight per Dozen, 6 Lbs.	3.00

OVERHEAD CARRIER TRACK

LOUDEN-TRACK CAN BE BENT TO SUIT ALL CONDITIONS

Fig. 2607
View No. 1

Fig. 2608
View No. 2

One of the handy features of Louden Track is that it can be bent without heating into any sort of irregular curve, right on the job, to meet existing requirements.

View No. 1 shows our special bending castings attached to a post and one man bending a straight piece of track into the desired curve. View No. 2 shows the irregular curve that was bent, and No. 3 shows the curve in place as a unit of the complete installation.

Ordinarily we bend all irregular curves at the factory, but occasionally definite requirements are not known until the installation is being put up, or sometimes machinery is changed around, necessitating a change in the Overhead Track System, and these are the times when it is convenient to bend the track without the delay of having to send it into the factory, or reordering.

The Louden Special Bending Irons shown above are made in pairs that can be quickly attached to any post or necessary support.

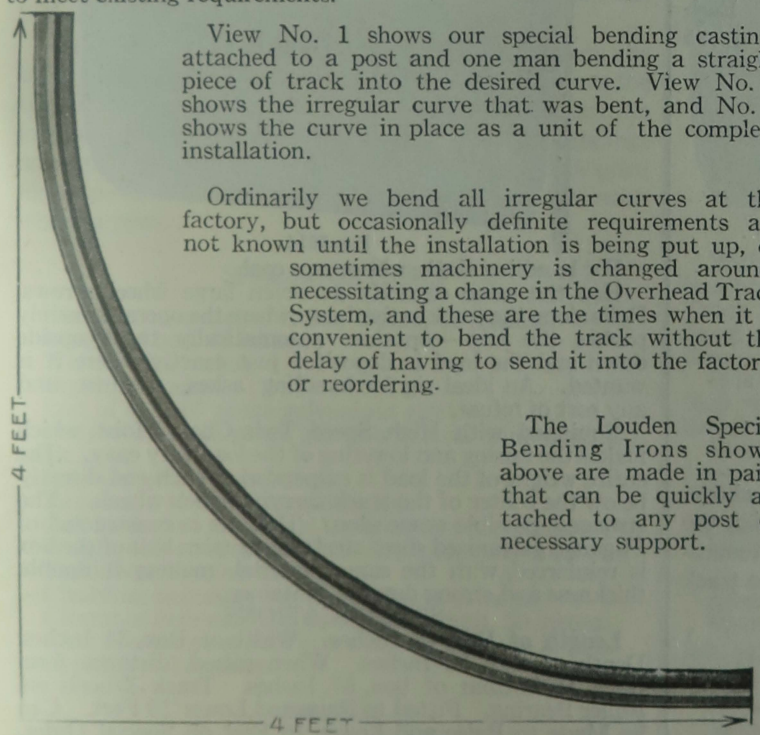


Fig. 2609

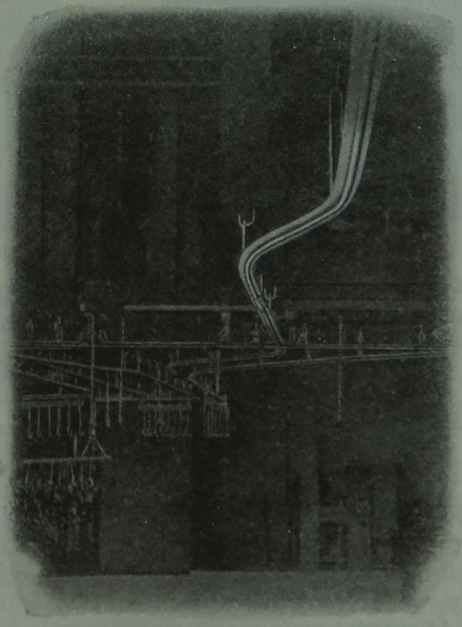


Fig. 2610
View No. 3

Illustration shows our regular bent section, used where the track turns a corner at right angles. This standard section is formed on our track bending machine and is curved on a four foot radius. Six feet of straight track is required for this curve. Louden Track can be curved to fit all conditions—there is no arrangement too complicated.

	Each
NO. 639—Standard 6 foot Bent Section, Weight Each, 12½ Lbs.	$2.25

OVERHEAD SWITCHES

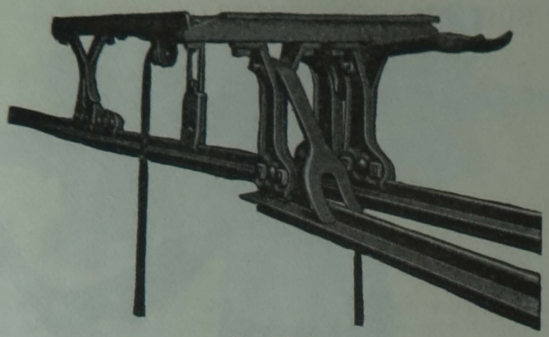


Fig. 2611

TWO-WAY

Very compact and reliable two-way switch; easily operated; the end section of the main track is hinged and controlled by the switch cord; when the switch cord is pulled the track is pulled into the desired position and the guard on the track to be used raises; the guard instantly drops when the track to which it is attached is left open, so that the car can not run off the track at an open switch.

It is made reversible, or right and left, so that branch tracks can be used on either side of the main track. As many as six branch tracks can be used with a single main track. Easily installed in almost any position.

SPECIFICATIONS

Length of Mounting Block, 38 Inches.
Width of Mounting Block, 15 Inches.
Distance from Top of Block to Bottom of Track, 10 Inches.

Each
NO. 736—Weight Each, 29 Lbs. $7.75

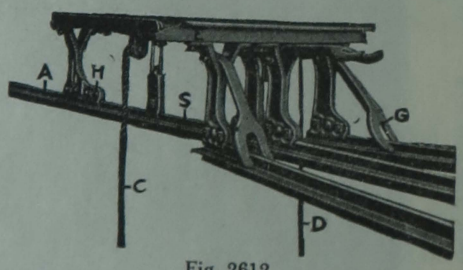


Fig. 2612

THREE-WAY

Operates the same as the two-way switch shown above. It can be operated from below, no matter how high the track may be hung. The guard, which works automatically, will prevent the carrier from running off the track should switch be left open.

SPECIFICATIONS

Length of Mounting Block, 38 Inches.
Width of Mounting Block, 15 Inches.
Distance from Top of Block to Bottom of Track, 10 Inches.

Each
NO. 795—Weight Each, 31 Lbs. $9.25

CROSS-OVER SWITCHES

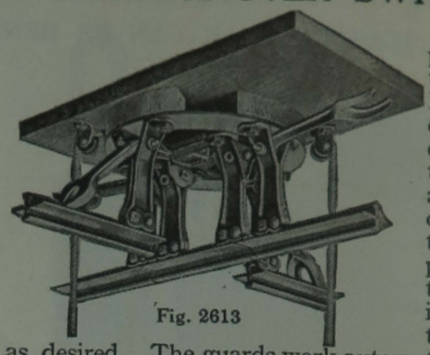


Fig. 2613

Mounted on a plank ready to attach to the ceiling. It is frequently necessary and often convenient to have tracks cross at right angles. This cross over switch solves the problem. By pulling on the cords the central section is thrown into position for either track as desired. The guards work automatically, dropping in place to guard the open end, and lifting, as shown, to clear the carrier wheels when the central is in place.

SPECIFICATIONS

Length of Mounting Block, 24 Inches.
Width of Mounting Block, 12 Inches.
Distance from Top of Block to Bottom of Track, 10 Inches.

Each
NO. 849—Weight Each, 28 Lbs. $8.50

COAL CARRIERS

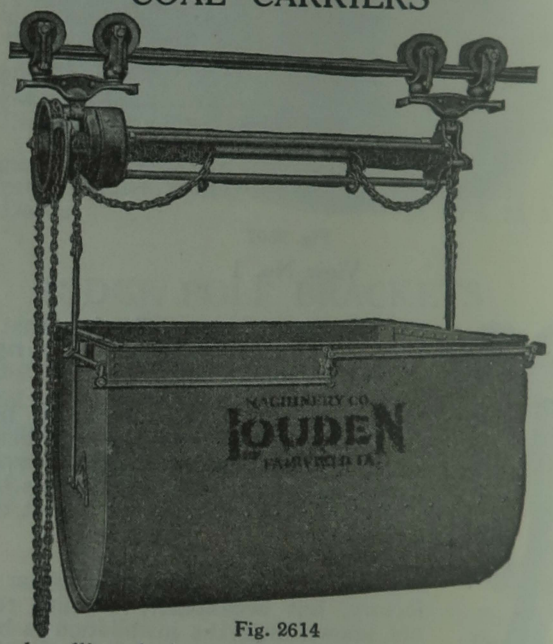


Fig. 2614

For handling slack, nut or egg coal.

Has the same capacity as seven large wheelbarrows. Rolls along the track to the dump, where the operator merely pushes the trip—container automatically turns upside down and the load is deposited just exactly where it is wanted. An ideal rig for handling ashes, sawdust and any sort of refuse.

Equipped with High Speed Twin Chain Hoist, which makes the raising and lowering of the load very easy. The entire weight of the load is suspended at each end directly below the center of the truck carrying track wheels. The strongest possible suspension. The box is constructed of 14-gauge galvanized sheet steel; the bottom half of the box is reinforced with the same material, making it double thickness and strong durable container.

SPECIFICATIONS

Length of Box, 48 Inches. Width of Box, 34 Inches. Depth of Box, 32 Inches. When raised, distance from track to bottom of box, 57 Inches. Track Wheels are Roller Bearing. Fitted to Raise and Lower 10 Feet. Can be Made to Raise and Lower 16 Feet on Special Order.

Lifting Power, 1 Pound Pull Raises 26⅔ Pounds.
Carrying Capacity, 2000 Pounds.
Capacity of Box, 20 Bushels of any Kind of Coal.
Box is Water Tight.

Each—Shipping Weight Each, 475 Lbs. $115.00

FACTORY CARRIERS

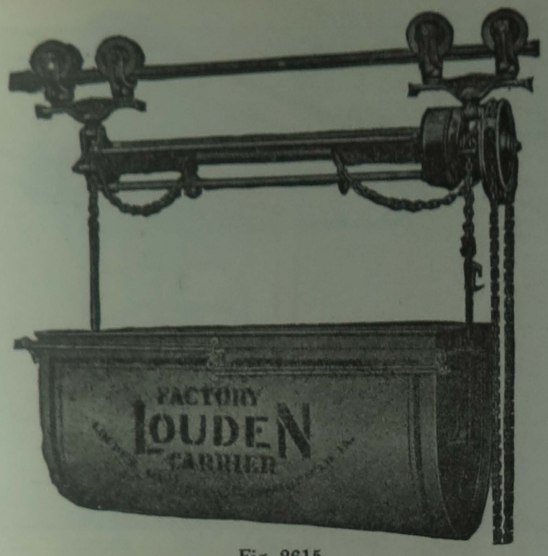


Fig. 2615

This carrier has a smaller container for holding the load, but, with this one exception, it is identical in construction and design to coal carrier shown on a previous page. Is strongly recommended for conveying sand, removing borings or filings from drilling and turning machinery, or for any other similar work where a concentrated material is handled. When lowered for filling, the box rests on the floor. When loaded, it is hoisted up close to the track, where it is entirely out of the way while being conveyed. The carrier is equipped with high speed twin chain hoist, the raising and lowering mechanism of which is geared so that a one-pound pull on the hand chain will lift 26 pounds on the gear, the ratio being such that a maximum load can be very easily and quickly hoisted.

After the container is filled the carrier rolls along the track to the dump, where the operator merely pushes the trip—container automatically turns upside down and the load is deposited just exactly where it is wanted. Another advantage with this system is that material can be piled high up—a very hard as well as inconvenient task with wheelbarrows.

SPECIFICATIONS

Distance on center of lifting chains, 48 inches.
Length of box, 48 inches.
Width, 27⅛ inches.
Depth, 22 inches.
End of box, 16 gauge galvanized steel.
Body of box, 20 gauge galvanized steel reinforced with angle iron.
Hoisting gear, 35 to 1 ratio.
Raises and lowers 6 feet, 6 inches.
Can be made to raise and lower 16 feet on special order.
Weight of load suspended directly under track trolleys.
Track wheels roller bearing.
Clearance necessary for track wheels, 5 inches.
Clearance necessary for box when upright, 50 inches.
Clearance necessary for box when dumped, 56 inches.
Capacity, 10 bushels.

NO. 1358	Each
4 Track Wheels; Weight Each, 287 Lbs.	$...
8 Track Wheels; Weight Each, 310 Lbs.	....
16 Track Wheels; Weight Each, 434 Lbs	....

Prices on Application

HOLDERS FOR OVERHEAD CARRYING SYSTEMS

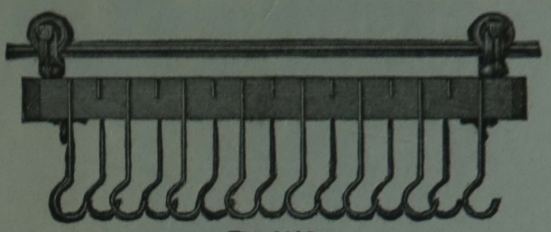


Fig. 2616

Carrier is especially designed to carry large varieties of material of different sizes and shapes. Small articles, such as castings, may be bundled together and a bundle hung on each hook. When loaded in this way the carrier has an exceptionally large capacity.

Track wheels roller bearing.

Distance on center front and rear wheels, 3 feet 8 inches. However, this distance may be varied to suit any requirement.

Hooks made out of steel rod of 1 1/32 inch diameter.
Bumper plate on each end of cross bar.
Diameter track wheels, 4 inches.
Bottom of track to bottom of hooks, 16 inches.
Regularly equipped with 15 hooks.
Hard pine cross bar. Size 2 inches by 4 inches.
Bumper plates, 16 gauge galvanized iron.

	Each
NO. 1304	$12.00

BARREL GRABS

Fig. 2617

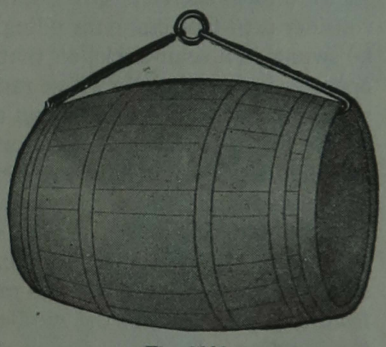


Fig. 2618

With barrel grab any barrel can be picked up instantly in a horizontal position and conveyed over the Overhead Track System to any desired point of storage, whether it be up close to the ceiling on top of the pile or down on the floor—all by one man, quickly, easily and safely.

It is only a second's job to hook the grabs in place, and they will absolutely hold any weight that the ordinary barrel is capable of holding.

If one end of a filled barrel is open, or if for any other reason it is necessary to lift the barrel in an upright position, chain grabs should be used.

Capacity of barrel grab, 1000 pounds.
Arms made out of ⅜x1⅜-inch wrought iron.
Ring 3-inch diameter, made out of ½-inch material.
Arms adjust themselves to different size barrels.
Made for hogsheads on special order.

	Each
NO. 1329—2 Prong	$2.75

Capacity, 2000 pounds.
Hooks, ⅜x1⅜-inch wrought iron.
9/32-inch electric weld chain.
Ring at top, ½-inch material, 3-inch diameter.
Links attaching chains to steel grabs, 5/16x1½-inch diameter.
Made for large hogsheads on special order.

	Each
NO. 1330—3 Prong	$8.00

SWINGING STEEL CRANES

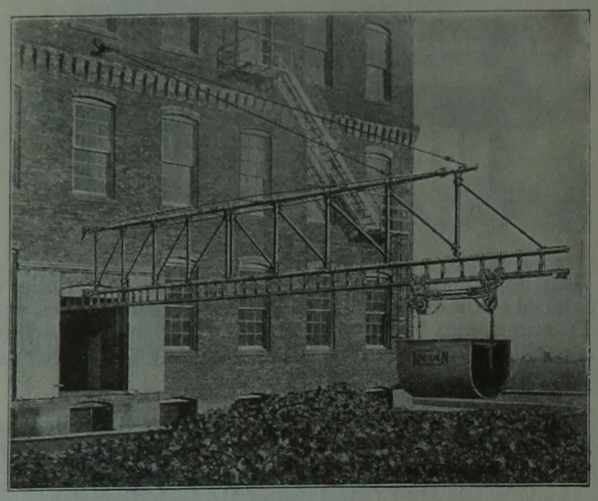


Fig. 2619

This Swinging Crane is hinged to the building above the door in line with the overhead track and extends out over the yard for a distance varying from 12 to 40 feet, according to the crane length, without posts or supports of any kind being necessary in the yard.

Aside from the elimination of all posts and supports in the yard, the really big feature of the Swinging Crane is that it affords such a large dumping area. As an example, consider a 40-foot crane for piling up coal. The crane can be swung in a semi-circle, so that the area over which it operates is a semi-circle whose radius is 40 feet. In other words, it swings around over an area of more than 2,500 square feet. If the track were one straight line out from the building, it would have to extend out 200 feet to obtain the same dumping area. It can be used for piling up any type of material—sand, gravel, coal, boxes, crates, pig iron, sacks, bundles, barrels, etc. Or the crane can be swung around over the pile and material can be picked up from any point within the semi-circle and conveyed into the building. Different classes of material may possibly require certain specific kinds of carriers, but the crane always operates just exactly the same regardless of the material carried.

The Howe Truss Construction used consists of two main booms hinged to building, main booms being made of 2⅜ O. D. steel tubing; top boom strongly side trussed. Truss rods and truss stays made of 1$\frac{1}{16}$ O. D. tubing; vertical truss pipe is made of 1⅞ O. D. tubing; diagonal trusses made of 1⅝ O. D. tubing.

Guy wires are made of 0000 basic steel wire; crane can be swung in semi-circle; vertebrae hinge connects track in building with track on crane. Supporting track hangers are spaced 12 inches apart. Bottom of track is 7 inches below bottom of crane. Capacity, 1,600 pounds. (40-foot crane shown in illustration.) Cranes made in 12, 22, 30 and 40-foot lengths.

	Each
NO. 1324—Length, 12 Feet	$75.00
NO. 1324—Length, 22 Feet	115.00
NO. 1324—Length, 30 Feet	150.00
NO. 1324—Length, 40 Feet	180.00

TRAVELING CRANES

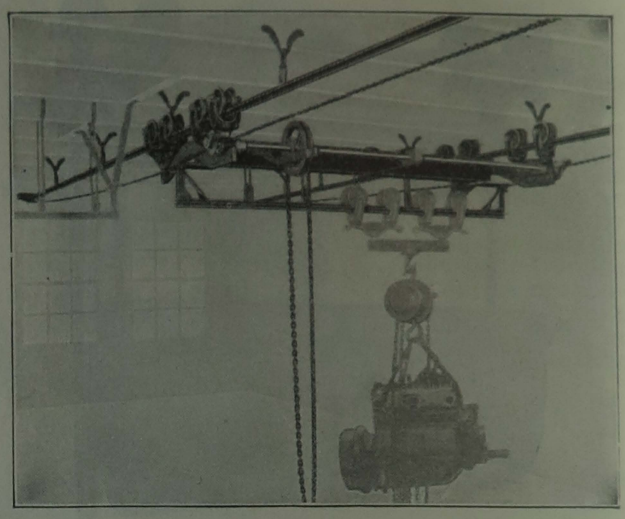


Fig. 2620

The handiest and most efficient traveling crane ever designed for all kinds of lifting and conveying work.

As can be seen from illustration, two main tracks parallel with each other are placed at each side of the building or any other desired distance apart and run the entire length of the room. Operating back and forth on these two main tracks are trolleys which carry a cross track running at right angles to the two main tracks. This cross track crane carries a trolley and a hoist, making it possible to work from one side of the room to the other; and because the entire crane can be shifted from one end of the building to the other on the main tracks, there is not a single foot of space in the entire room that is not accessible to the hoist.

An especially handy feature of this crane is that it readily connects up with any number of stationary tracks at either side of the room. In this way, a load can be picked up at any point on the floor covered by the crane, moved along until the crane automatically connects with the desired stationary track, and then the load may be run off the crane onto the stationary track and into other buildings or departments. The reverse is also true, and where it is necessary to store material in a certain room the above arrangement is one of the biggest labor-saving devices possible to install. Tracks from different departments terminate at the ends of the crane—the crane connects up with all these tracks and receives materials to be deposited in the room it covers.

This entire outfit is exceptionally strong in construction and makes it possible to operate over more floor space than any other device ever designed. In garages it is just the outfit for working on a number of cars scattered over the room.

Width and length of Crane varies according to requirements. Supporting hangers on all tracks are spaced 12 inches apart; all track wheels are roller bearing. Shaft to which hand chain wheel is attached for operating crane lengthwise of room is 1$\frac{1}{16}$ O. D. gas pipe. Regularly furnished with 20 feet endless hand chain. Side chains for operating crane lengthwise are made of 4-0 wire links. One revolution of hand chain wheel moves crane 10 inches lengthwise. Cross track of crane may align up with any number of stationary tracks, so that load can be transferred direct from crane to any one of them.

	Each
NO. 1310—Parallel Track 20 Feet Long, and Cross Track 12 Feet Long	$100.00

AGRICULTURAL FORGES

Fig. 2621

Strongly constructed, light repair forge, having three extra strong and well braced legs of seamless tube steel; substantial deep cast iron hearth. Crank operated. The gears are accurately fitted and the fan shaft runs in long babbitted bearings, making the operation very easy. Gives a strong blast, sufficient for all work possible with a forge of this size.

Illustration shows No. 161. No. 061 is the same except that it is operated by a crank instead of a lever, and No. 162 is lever operated with a three-leg stand instead of four. Furnished with shield, half hood or full hood.

NOS.	Dia. Hearth, Inches	Dia. Fan, Ins.	Type of Hood	Wgt. Each, Lbs.	Each
061	18	8	Shield	80	$14.00
061H	18	8	Half-Hood	85	16.00
161	18	8	Shield	70	14.00
161H	18	8	Half-Hood	75	16.00
162	22	9	Shield	100	24.00
162H	22	9	Half-Hood	105	27.00
162F	22	9	Full Hood	110	30.00

RIVET FORGES

Round cast iron hearth and flat, round tuyere, mounted on four steel pipe legs, equipped with a geared blower with a ratio of 47½ to 1; crank may be turned in either direction; gears and pinions of blower are machine cut.

Blower and fan are very compact and may be turned to operate on from either right or left hand side.

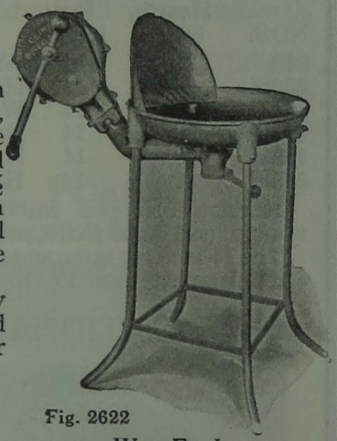


Fig. 2622

Nos.	Dia. Hearth, Inches	Dia. Fan, Inches	Type of Hood	Wgt. Each, Lbs.	Each
722	22	10	Windshield	145	$27.00
722H	22	10	Half-Hood	150	30.00

Fig. 2623

Round steel plate fire pan and windshield mounted on four steel pipe legs.

Furnished with geared blower with a ratio of 47½ to 1 and having a 10-inch fan case.

May be used for right or left hand drive by releasing head clamp and turning head around to other side. Crank also may be turned in either direction.

NOS.	Dia. Hearth, Inches	Dia. Fan, Inches	Wgt. Each, Lbs.	Each
710	18	10	115	$31.00
711	22	10	125	34.00
712	24	10	135	38.00

RIVET FORGES

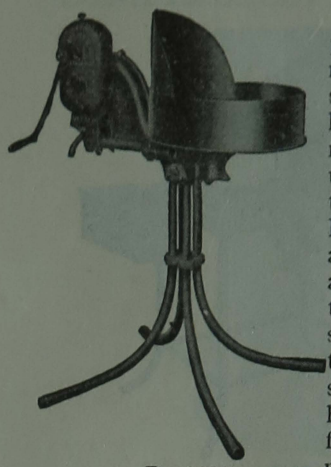


Fig. 2624

Has heavy round steel plate fire pan securely riveted; regularly mounted on four substantial ¾-inch, steel pipe legs securely braced. A heavy round tuyere plate distributes the heat so as to insure the best results in heating. Forge occupies small space and can be readily taken apart and moved from place to place. Equipped with silent blower, gear ratio, 47½ to 1. The silent blower consists essentially of a blower head, a gear case, and the fan. The gear case is a one-piece oil-tight leak-proof iron casting with removable over; high speed pinion, which is on the shaft carrying the fan, is made of steel and is cut helical; fan shaft runs in finest radial ball bearings. End of shaft is protected from dust and grit by brass cap. Blades of fan taper Nos. 210, 211 and 212 have detachable wind shield. Nos. 210H, 211H and 212H have steel half-hood.

NOS.	Dia. Hearth, Inches	Dia. Fan Case, Ins.	Type of Hood	Weight Each, Lbs.	Each
210	18	12	Windshield	115	$35.00
211	22	12	Windshield	120	38.00
212	24	12	Windshield	130	41.00
210H	18	12	Half-Hood	120	38.00
211H	22	12	Half-Hood	130	43.00
212H	24	12	Half-Hood	140	45.00

CAST IRON FORGES

Good forge for general all-round work on farms and for contractors and mechanics. Nos. 742 and 742H, equipped with round, hinged and balanced ash grate tuyere. Nos. 744 and 747H equipped with vulcan tuyere, all numbers furnished with reversible hand blower. Gear ratio, 47½ to 1 has cast iron hearth, built in coal box mounted on four well braced steel pipe legs. The blower is very compact, the head is standard mounted on a long tuyere pipe with regulation clamp and thumb nut and can be easily taken apart.

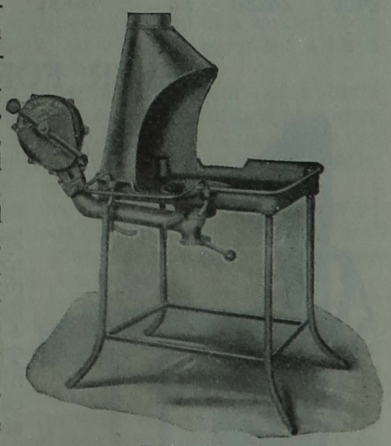


Fig. 2625

NOS.	Size Hearth, Inches	Dia. Fan, Inches	Type of Hood	Weight Each, Lbs.	With Water Tank, Each	Without Water Tank, Each
742	25x36	12	Windshield	205	$42.00	$38.00
742H	25x36	12	Half-Hood	215	44.00	40.00
744H	31x44	12	Half-Hood	300	45.00	41.00
747H	32x45	12	Half-Hood	350	55.00	50.00

FORGES

Fig. 2626

Desirable for garages and general indoor work; has heavy cast iron hearth and sheet steel water tank mounted on well braced ¾-inch steel pipe legs. A rapid and easy heater, furnished with round tuyere iron with revolving clinker breaking valve and hinged and balanced ash gate which opens and closes by touch of the foot. Heavy pressed steel hood. Equipped with silent blower, gear ratio 47½ to 1.

The blower consists essentially of a blower head, a gear case and the fan; gear case is a one-piece oil tight and leak-proof iron casting with removable cover. High-speed pinion, which is on the shaft carrying the fan, is made of steel and is cut helical; all end thrust is balanced on adjustable ball bearings; end of shaft is protected from dust and grit by brass cap; high speed pinion runs in bath of oil, all other parts lubricated by splashing.

NOS.	Size Hearth, Inches	Dia. Fan, Inches	Type Hood	Weight Each, Lbs.	With Tank, Each	Without Tank, Each
240H	23x30	12	Half Hood	225	$44.00	$40.00
240F	23x30	12	Enclosed Hood	235	51.00	47.00

LEVER FORGES

Fig. 2627

General blacksmith's lever forge; good all-round heating; will produce welding heat on 3-inch iron in 5 minutes or 4-inch iron in 10 minutes. This forge may be furnished with indestructible cast iron instead of sheet steel hood.

NOS.	Size Hearth, Inches	Dia. Fan, Inches	Kind of Hood	Weight Each, Lbs.	Each
0	28x40	14	Sheet Steel	300	$50.00
0-C	28x40	14	Cast Iron	340	50.00

Regularly shipped without water tank. If tank is wanted add $5.00 to list price.

MACHINISTS' FORGES

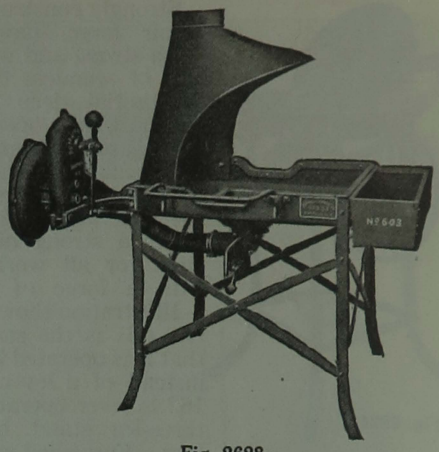


Fig. 2628

Built in several sizes, making them suitable for any range of work, light and heavy; used extensively by tool makers, die sinkers, miners, bridge builders, contractors, horse-shoers, etc. The rolled steel plates are of great toughness and elasticity; fire pan is strongly reinforced with angle steel ribs around the edges, and angle steel legs are cross-braced with bar steel. All forges furnished with heavy duty vulcan tuyere and 14-inch silent blower; gear ratio, 47½ to 1.

NOS.	Size Hearth, Inches	Diam. Fan, Inches	Type Hood	Weight Each, Lbs.	Each
230	24x24	14	Windshield	225	$45.00
230H	24x24	14	Half-Hood	230	50.00
231	30x30	14	Windshield	260	55.00
231H	30x30	14	Half-Hood	270	60.00
232H	30x36	14	Half-Hood	310	65.00
233H	30x40	14	Half-Hood	330	70.00

Regularly shipped without water tank. If tank is wanted, add $5.00 to list price.

The 14-inch fan is recommended. For 12-inch fan deduct $2.00 from list price. For 16-inch fan add $5.00 to list price.

STATIONARY FORGES

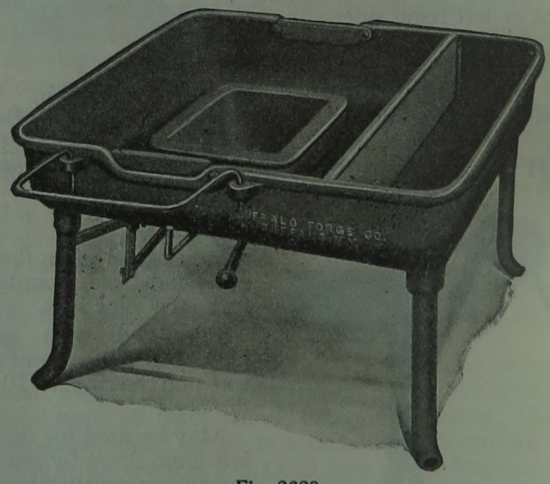


Fig. 2629

For railroad repair shops, heavy blacksmithing, etc., are equipped with deep fire, side and center blast, anti-clinker dumping tuyere and have gates on both sides for decreasing depth.

NO.	Size Hearth, Inches	Height to Top of Hearth, Inches	Depth, Inches	Weight, Lbs.	With Tank, Each	Without Tank, Each
48	38x42	27	3½	350	$50.00	$45.00
49	38x42	27	7	450	40.00	35.00

TUYERES

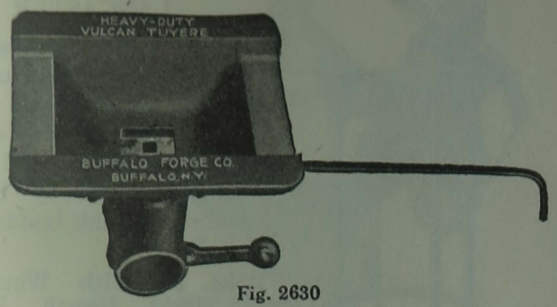


Fig. 2630

The rising and falling action gives as large and as small a fire as desired and affords a larger clearance for ashes and clinkers; the fire pot is deep and heavy, to insure against burning out. It can be detached from the base so that it may be replaced at small expense and without buying a complete new tuyere; the ash gate is hinged and balanced so that it opens and closes automatically, or ashes can be dumped by a touch. Blast is forced in fire pot through three tapering, converging channels; currents collide at high speed, and the blast is scattered all through the coal bed as from an explosion. The result is a large, deep, intense fire, giving the cleanest, strongest welds because of the high blast pressure.

In connection with the silent blower, this tuyere has a very large welding capacity. It takes 4-inch iron up to 12 inches long in one heat without moving the iron.

This tuyere is now furnished with all heavy blacksmith forges.

Over All Width and Length, Inches	12½x14
Inside Depth of Fire Pot, Inches	4½
Weight Each, Lbs.	60
Each	$6.00

STATIONARY FORGES

ELECTRICALLY OPERATED

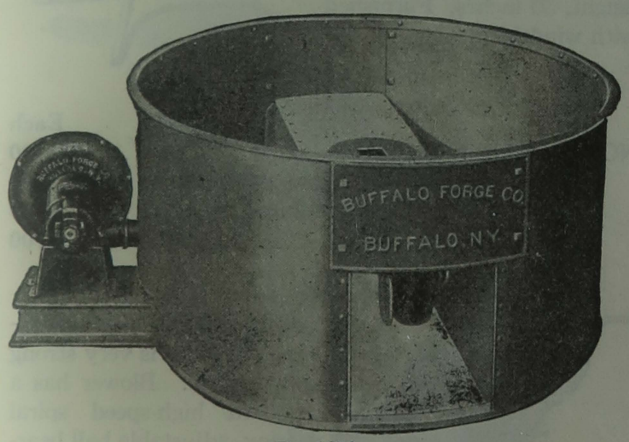


Fig. 2631

Built of heavy sheet steel, rigidly stiffened and strengthened to meet every strain of service.

May be set in the location most convenient, without any reference to line shafts, pulleys or the requirements of belting. When placed in position, connections are made by simply running the wires to the nearest electric circuit. When not in use the current is shut off and no power wasted. Equipped with an anti-clinker dumping tuyere.

Fitted with variable or constant speed electric blower, mounted on a rigid sub-base riveted to the forge.

NOS.	885	886
Height to Top of Fire Pan, Inches	26	26
Diameter of Fire Pan, Inches	36	48
Weight Each, Lbs.	400	500
No. of Electric Blower	2E	2EH
Each	$138.00	160.00

COMPRESSED AIR FORGES

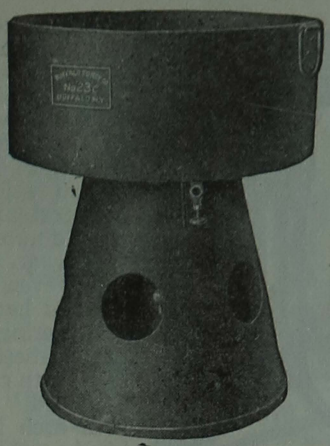


Fig. 2632

Compressed air is fed to fire through a specially constructed, three-stage injector. Perfect regulation of blast obtained by simple needle valve, through which compressed air is supplied; once the needle valve is adjusted, no further regulation is required. It will work at any pressure ranging from 15 to 100 lbs. In the first two stages, five volumes of outside air are drawn into each volume of compressed air used. In the third stage the air is thoroughly mixed and reduced to proper pressure for fire.

Being made of heavy sheet steel securely riveted and properly braced, it will stand the roughest handling and abuse without its working qualities becoming impaired.

NOS.	80	81	82	83	84
Fire Pan, Inches	18	20	22	24	28
Height, Inches	31	31	31	31	31
Shipping Weight, Each, Lbs.	85	80	90	100	115
Each	$22.00	24.00	26.00	28.00	32.00

OIL BURNING RIVET FORGES

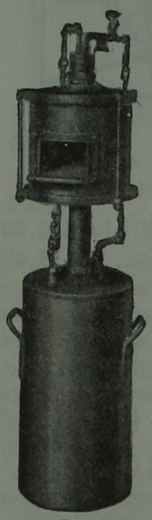


Fig. 2633

Consists essentially of a welded steel oil tank, on which is mounted a head or fire chamber.

Air is supplied by means of a single connection which furnishes pressure for the oil supply as well as air for the atomizer. The tank is tested under an air pressure of 100 pounds.

The fire chamber consists of a steel plate housing, with cast iron top and bottom plates held together by means of three screw bolts.

The lining is a 2-inch specially molded fire brick of the best quality of refractory material obtainable. The bottom is strengthened by increasing thickness to 2½ inches.

Temperature is under perfect control, and it is impossible to burn rivets even when left in the forge for long periods at a time. This insures clean uniform rivets free from the objectionable coating of oxide or from dirt or ashes.

NOS.	1	2
Height Over All, Inches	43	45
Height Chamber, Inches	11½	14½
Inside Dia. Chamber, Inches	7	10
Inside Height Chamber, Inches	6	8
Fire Opening, Inches	3⅝x5¼	4x6
Capacity Tank, Gals.	12	18
Weight Each, Lbs.	125	200
Each	$100.00	150.00

BLACKSMITH STEEL BLOWERS

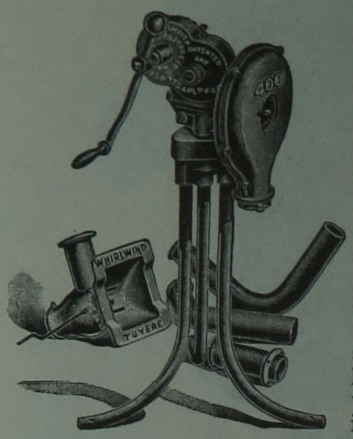


Fig. 2634

High speed spiral gearings and adjustable ball bearings; will produce a roaring white-heat pressure blast without injury to the gearings or the bearings. The phosphor bronze spiral gear and tool steel spiral shaft make the durability of the blower an absolute certainty even with the most careless handling. The ball bearings are made of the highest grade tool steel, with cups and cones hardened and ground; with each blower is furished a "whirlwind" blast, anti-clinker, heavy nest tuyere iron. It produces a rotary blast and heats iron one third quicker, as the heat is not blown through the fire as in other tuyere irons. The saving in time and coal will pay for the cost of the blower in a short time. Furnished right-hand unless ordered left-hand. Crank turns either way to make blast.

	Each
NO. 400—Diameter Fan, 12 Inches; Complete with Piping, Blower Weight, 105 Lbs.; Tuyere Iron, 55 Lbs.	$37.00

AGRICULTURAL LEVER FORGES

Hearth is deep and heavy. The bearings are taper-turned and long. Lever is of the ratchet motion type and very simple and durable; legs are strongly braced and screwed in the leg sockets.

Cast iron fire hearth; cast iron gearing blower and fan case.

Hearth, 22 inches in diameter; fan, 9 inches in diameter; height, 30 inches.

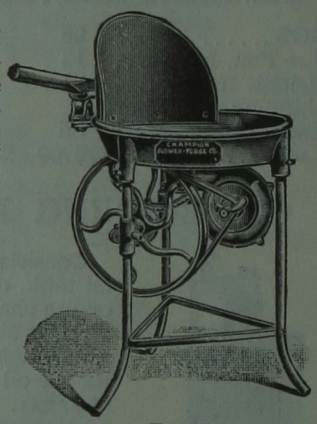


Fig. 2635

	Each
NO. 100—With Windshield, Weight Each, 100 Lbs.	$16.00
NO. 101—With Half-Hood; Weight, 105 Lbs.	18.00

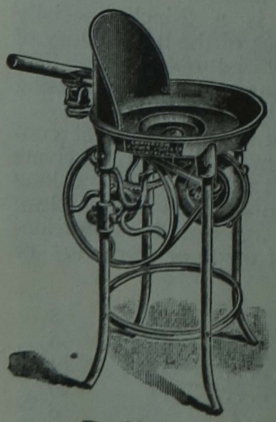


Fig. 2636

Especially adapted for farmers who only have use for forge occasionally and then only for light work; has taper-turned bearings. Legs are strongly braced and screwed in the leg sockets, substantial and well built.

Cast iron hearth; cast iron gearing blower and fan case. Direct strong blast is produced by slow lever motion. Gearing practically noiseless.

Hearth, 18 inches in diameter; fan, 8 inches in diameter; height, 30 inches.

	Each
NO. 150—With Windshield; Weight Each, 85 Lbs.	$14.00
NO. 151—With Half-Hood; Weight, 90 Lbs.	16.00

LEVER FORGES

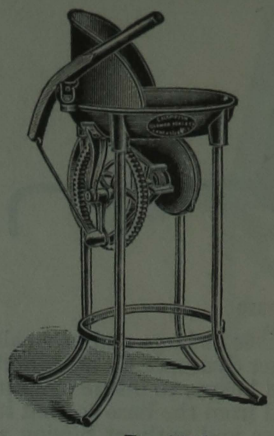


Fig. 2637

LANCASTER

Cast iron gearing and blower. Four tubular steel braced legs; cast iron hearth, made with double ratchet. Strong and substantial, used by bridge, boiler and tank builders.

	Each
NO. 55—With Windshield, Hearth, 18 Inches in Diameter; Height, 30 Inches; Diameter Fan, 8 Inches	$24.00

RIVET FORGES

MIDWAY

Suitable for bridge builders, elevated and steam railroad contractors, etc. Crank turns either way to make blast. Constructed from structural steel. Blower has spiral gearing, ball bearing and runs noiselessly. Steel hearth is 18 inches in diameter; fan is 10 inches in diameter; height, 30 inches. Furnished with windshield.

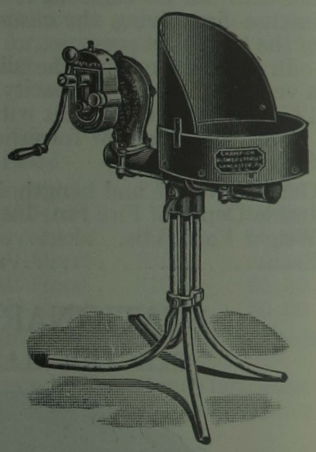


Fig. 2638

	Each
NO. 78—Weight, 120 Lbs.	$31.00
Hearth, 22 Inches Diameter, Extra	3.00
Hearth 24 Inches Diameter, Extra	6.00
Half-Hood, Extra	3.00

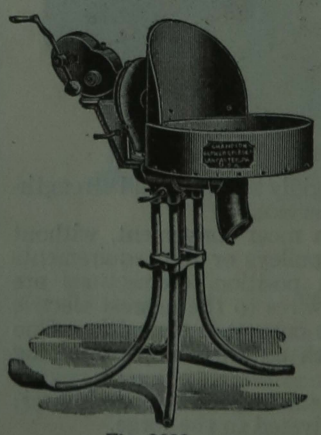


Fig. 2639

Constructed from structural steel and is very strong and durable. Blower has a patented high-speed spiral gearing, adjustable ball bearings and runs noiselessly. It will produce blasts to weld 3½ to 4 inch iron in ten minutes. The crank turns either way to produce the blast. Furnished with windshield. Hearth, 18 inches in diameter; height, 30 inches; fan, 9 inches in diameter.

	Each
NO. 401—With Windshield; Weight, 135 Lbs.	$35.00
NO. 402—140 Lbs.; Half-Hood	38.00
NO. 403—150 Lbs.; Full-Hood	40.00

LEVER FORGES

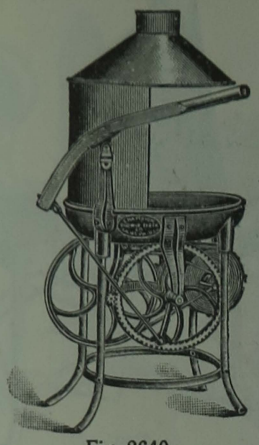


Fig. 2640

LANCASTER

Ratchet lever made with double ratchet, strong and substantial, and adapted for all kinds of medium work, such as bridge builders, boiler and tank builders; all gears are supplied with babbitted journal bearings, built to run smoothly and noiselessly. Legs are strongly braced and screwed in the leg socket. Hearth, 21 to 27 inches; height, 29 inches; diameter fan, 10 inches.

	Each
NO. 59—With Half-Hood, Weight Each, 190 Lbs.	$40.00
NO. 60—With Full-Hood, Weight Each, 200 Lbs.	42.00

BOILERMAKERS' FORGES

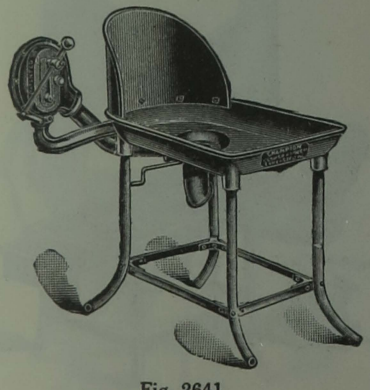


Fig. 2641

MIDWAY

Has midway spiral gear blower with ball bearings on high-speed shaft and all other bearings bushed. Spiral gearing is simple in construction and without small gears and pinions, and therefore is durable and practical. The gearing runs in oil in a dust proof casing, the crank turns in either direction to make the blast. Forge is suitable for boiler makers, jewelers, tank builders, etc.

	Each
NO. 72—With Windshield, Cast Iron Hearth, 23 x 35 Inches; Height, 30 Inches; Diameter Fan, 10 Inches; Weight Each, 215 Lbs.	$36.00

MACHINISTS' FORGES

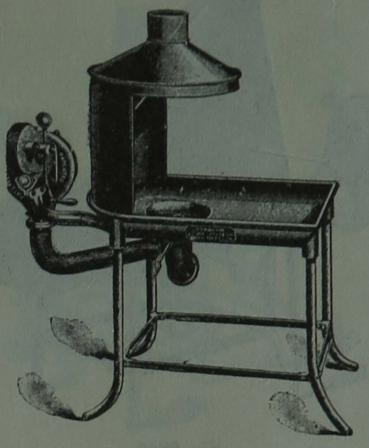


Fig. 2642

Cast iron hearth supplied with high speed spiral geared blower. A splendid forge with a shield, for railroad, bridge and boiler work, and with a half-hood for tool dressing and general repair work. Guaranteed to furnish sufficient blast in ten minutes to weld a 4-inch iron with ease. Hearth, 23x35 inches; height, 30 inches; fan, 10 inches in diameter.

	Each
NO. 435—With Half-Hood, Weight Each, 240 Lbs.	$44.00
NO. 436—With Full-Hood, Weight Each, 265 Lbs.	47.00

TOOLMAKERS' FORGES

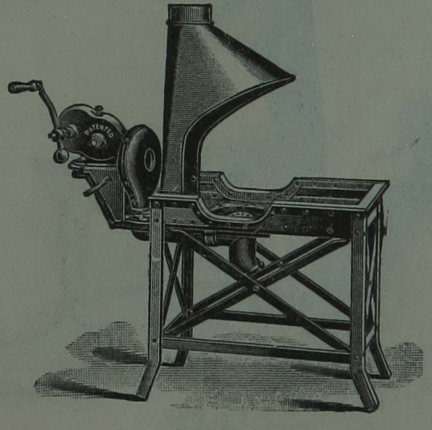


Fig. 2643

Especially adapted for horseshoers, garages, toolmakers, etc. Crank turns either way to make the blast. Has square hearth with angle steel legs riveted to corners. Each turn of the crank produces forty-six complete revolutions of the blast wheel. Has patented high-speed spiral gearing and runs noiselessly. Ball bearings are all adjustable with cups and cones lathe-turned from solid tool steel bar and hardened, then ground and polished.

	Each
NO. 405—With Half-Hood, Hearth, 24x24 Inches; Height, 30 Inches; Fan, 9 Inches in Diameter; Weight Each, 185 Lbs.	$49.00

BLACKSMITH FORGES

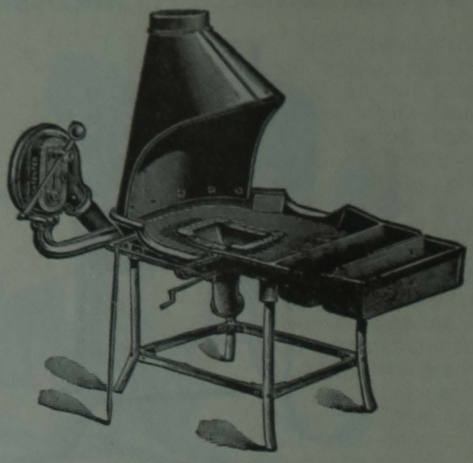


Fig. 2644

MIDWAY

Cast iron hearth with coal box combined and heavy nest tuyere iron; well built, direct-drive, spiral-geared blower which produces a good strong blast. Gearing runs in oil and in a dust-proof casing; ball bearings on high speed shaft and all other bearings are bushed; crank turns in either direction to make the blast, each turn producing forty-six revolutions of the blast wheel.

	Each
NO. 71—With Half-Hood, Hearth and Coal Box Combined, 32x45 Inches; Height, 30 Inches; Fan, 12 Inches in Diameter; Weight Each, 395 Lbs; Without Water Tank	$50.00
Water Tank, Extra	5.00

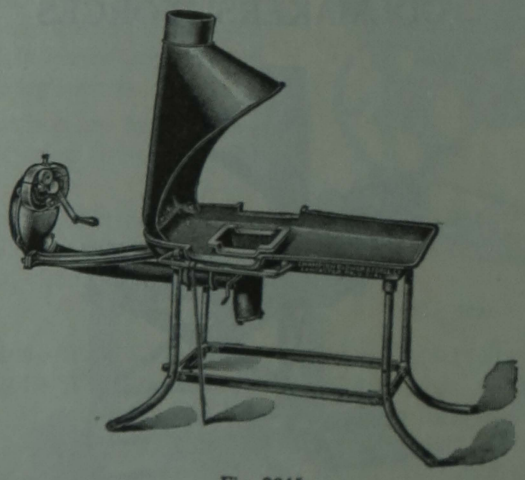


Fig. 2645

LANCASTER

Well built forge with cast iron hearth. Designed to meet the demand for a cheaper forge. Blower gears are supplied with bushed journal bearings, built to run smoothly and noiselessly. All gears run in dust-proof cases, and the crank turns either direction to produce blast. The tuyere used is a heavy nest ball type tuyere iron. Pipe legs are strongly braced and screwed in the leg sockets.

	Each
NO. 41—With Half-Hood, Hearth, 32x45 Inches; Height, 30 Inches; Fan, 12 Inches in Diameter; Weight Each, 390 Lbs; Without Water Tank	$50.00
Water Tank, Extra	5.00

BLACKSMITH FORGES

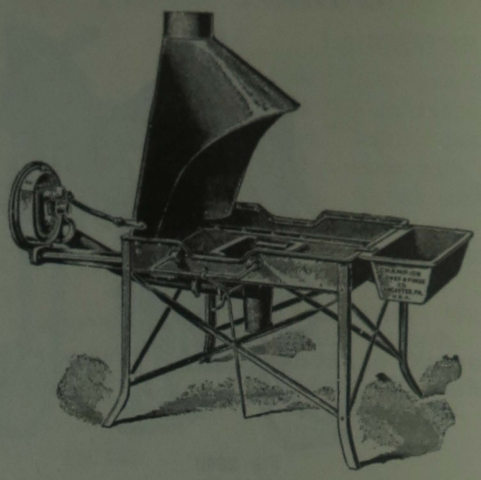


Fig. 2646

Adapted for horseshoers and blacksmiths; substantial and firmly built steel forge, built with heavy steel plate with its legs firmly riveted to the hearth and substantially braced. It has perpendicular sides six inches wide, making the hearth six inches deep. Spiral gearing is simple in construction and without small gears or pinions, and therefore is durable and practical. Gearings run in oil in a dust-proof casing; the crank turns in either direction to make the blast. Blowers have ball bearings on high-speed shaft; all other bearings are bushed; has heavy nest tuyere iron.

	Each
NO. 80—With Half-Hood; Hearth, 30x36 Inches; Height, 30 Inches; Fan, 12 Inches in Diameter; Weight Each, 305 Lbs.; Without Water Tank	$58.00
Water Tank, Extra	5.00

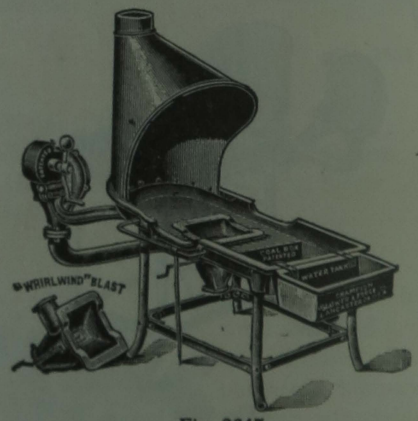


Fig. 2647

For garages, blacksmith and machine shops. Cast iron hearth; adjustable ball bearings. Supplied with sloped bottom coal box, located beneath the level of the bottom of the hearth, entirely out of the way. Coal can be kept at any degree of dampness desired.

Furnished with high-speed spiral geared blower and "whirlwind" blast anti-clinker heavy nest tuyere iron. Crank turns either way to make a blast, each turn producing forty-six complete revolutions of the blast wheel.

	Each
NO. 433—Cast Iron Hearth; 32x45 Inches; Fan, 12 Inches, Diameter; Weight Each, 410 Lbs.	$55.00
Water Tank, Extra	5.00

RIVET FORGES

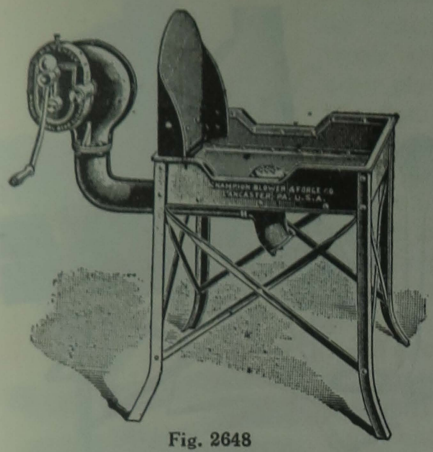


Fig. 2648

MIDWAY

Heavy pressed steel hearth, riveted to steel angle legs; sheet steel shield; cast iron gear case, blower and fan case; equipped with spiral geared blower and heavy nest tuyere iron and piping; crank turns either way for blast. Blower is strong and well built, with all bearings bushed except the high speed shaft, which has ball bearings; gearing runs in a bath of oil in a dust-proof casing.

Each

NO. 79 – With Wind Shield; Hearth, 24x24 Inches; Height, 30 Inches; Fan, 10 Inches in Diameter; Weight Each, 185 Lbs. $40.00
Extra for Half-Hood 5.00

LEVER FORGES

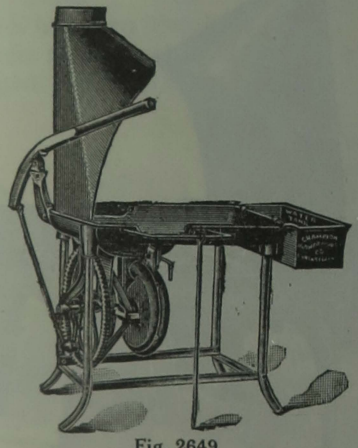


Fig. 2649

LANCASTER

Made with a double ratchet and is adapted for all kinds of general carriage and blacksmith work. Furnished with improved revolving anti-clinker ball tuyere iron for regulating the blast. The entire forge is substantially built with steel pipe legs screwed into sockets at the corners of the cast iron hearth; bar braces reinforce the legs near the bottom.

Each

NO. 61—With Half-Hood; Hearth, 28x40 Inches; Height, 20 Inches; Diameter Fan, 14 Inches; Weight Each, 355 Lbs.; Without Water Tank .. $50.00
Water Tank, Extra 5.00

BLACKSMITHS' FORGES

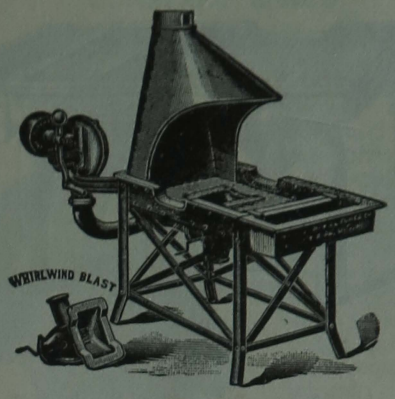


Fig. 2650

Hearth is made of heavy steel plate, with perpendicular sides six inches deep; furnished regularly with whirlwind blast, anti-clinker, heavy nest tuyere iron; heat is concentrated at the centre of the fire around the iron in the fire by the circular rotary whirlwind blast with no waste of heat going up the chimney. The blower furnished with this forge is a high speed spiral geared blower, with phosphor bronze spiral gear and tool steel spiral shaft which continuously meshes in eight full teeth and operates without noise or lost motion; crank turns either way and each turn of the crank produces forty-six revolutions of the blast wheel.

Each

NO. 408—With Half-Hood; Hearth, 30x36 Inches; Height, 30 Inches; Fan, 12 Inches in Diameter; Weight Each, 305 Lbs. $65.00
With Water Tank, Extra 5.00

TUYERE IRONS

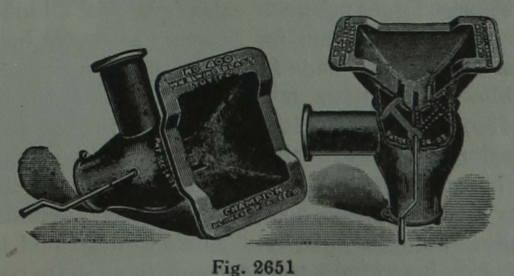


Fig. 2651

WHIRLWIND BLAST
ANTI-CLINKER

Produces a circular rotary blast that does not blow the heat up and out of the chimney, but concentrates the blast and heat in the tuyere nest. Supplied with a revolving pick for picking the clinkers out of the side slots without disturbing the fire from the top.

Each

NO. 60—Heavy Nest, 5 Inches Deep, 8¾ Inches Wide, 10½ Inches Long; Dimensions Over All, 12⅜x14¾ Inches; Weight Each, 60 Lbs. $10.00

STATIONARY FORGES

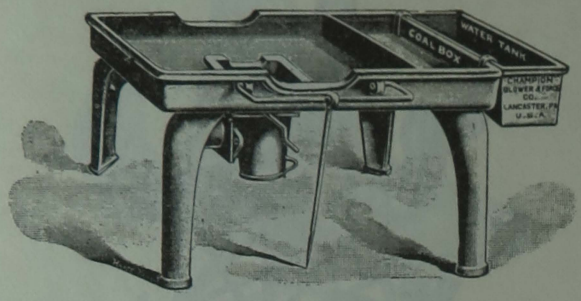


Fig. 2652

Made extra heavy for all kinds of blacksmith fires; the hearth is 3½ inches deep; supplied with the whirlwind blast, anti-clinker, heavy nest tuyere iron without extra cost. Cast iron frame and legs with removable cast iron water tank

	Each
NO. 11½—Hearth Over all with Water Tank 38x52 Inches; Height, 26 Inches; Weight Each, 410 Lbs.	$30.00
Regular Half-Hood, Extra	6.25

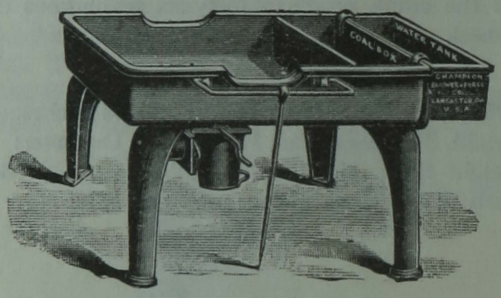


Fig. 2653

These blast forges are made extra heavy for all kinds of blacksmith fires, and are far superior to forges built of brick or stone. Are made for power, but can be used for hand blower or bellows as well. When using the Down Draft Hood Attachment it is understood that all natural draft is done away with. It is therefore necessary to use a power blower to make the blast and also an exhaust fan to draw all smoke, gases and fumes from the fire and shop generally. Supplied with blast gate and whirlwind blast, anti-clinker, heavy nest tuyere iron without extra cost.

	Each
NO. 12—Size of Hearth Over All with Water Tank, 38x52 Inches; Depth of Hearth, 7 Inches; Height, 26 Inches; Weight Each, 400 Lbs.	$35.00
NO. 12½—Size of Hearth Over All with Water Tank, 39x63 Inches; Depth of Hearth, 7 Inches; Height, 26 Inches; Weight Each, 515 Lbs.	40.00
NO. 13½—Size of Hearth Over All with Water Tank, 48x73 Inches; Depth of Hearth, 7 Inches; Height, 26 Inches; Weight Each, 835 Lbs.	70.00
Down Draft Hood to Fit any of the Above Forges; Weight Each, 270 Lbs. Extra	35.00

ELECTRIC FORGES

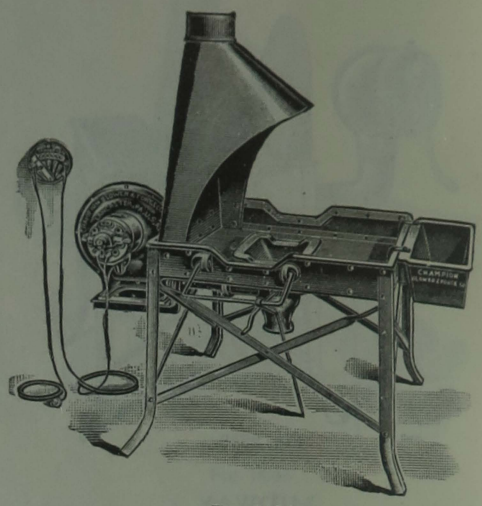


Fig. 2654

Electric driven forge with the whirlwind blast, anti-clinker, heavy nest tuyere iron; one-fire variable speed electric blower with universal motor for both direct and alternating current, either 110 or 220 volts, and with detached six speed rheostat. Furnished with attachment, cord and plug to fit any light socket; cast iron fan case; complete and practical outfit for those desiring a spacious steel hearth forge. Angle steel legs are cross braced with flat steel bars, riveted.

	Each
NO. 440—With Hood Hearth, 30x36 Inches; Height, 30 Inches; Weight Each, 285 Lbs.	$67.00
Water Tank, Extra	5.00

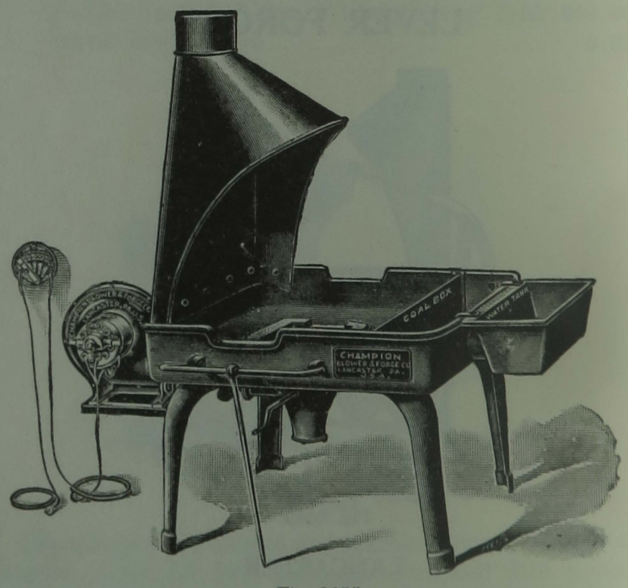


Fig. 2655

Extra heavy cast iron forge supplied with the whirlwind blast, anti-clinker, heavy nest tuyere iron and coal box; one fire variable speed electric blower with universal motor for both direct and alternating current, either 110 or 220 volts, and with detachable six speed rheostat. Furnished with cord and plug to fit any light socket. Cast iron fan case; cast iron legs and detachable water tank.

	Each
NO. 442—With Coal Box and Hood; Hearth, 38x42x7 Inches; Height, 26 Inches; Weight Each 530 Lbs.	$90.00
Extra for Tank	5.00

ELECTRIC FORGES

Fig. 2656

Especially suited for machine and repair shops, and other places where a medium size forge is required; has heavy steel plate hearth, securely riveted and braced with angle irons, equipped with variable or constant speed electric blower (illustrated and described on this page) and 14-inch adjustable ball bearing silent blower. The blower consists essentially of a blower head, gear case and fan. The gear case is a one-piece oil tight and leak-proof iron casting with removable cover. High speed pinion on the shaft, carrying the fan is made of steel and is cut helical; fan shaft runs in finest radial ball bearings; end of shafts are protected from dust and grit by brass caps. Blades of fan taper; gear ratio, 47½ to 1. A six-speed regulator is furnished with every variable speed blower; forge can be operated by hand or power.

NOS.	Size Hearth, Inches	Hood	Weight Each, Lbs.	Each
931-H	30x30	Half-Hood	285	$82.00
932-H	30x36	do.	295	85.00
932-E	30x36	*	530	115.00
933-H	30x40	Half-Hood	315	88.00
932-F	30x36	Full-Hood	360	89.00
933-F	30x40	do.	380	92.00

*NO. 932-E has down draft hood.

These forges regularly shipped without water tank. If tank is wanted, add $3.00 to list price.

Fig. 2657

Has very wide spacious cast iron hearth, with ample capacity for heavy blacksmithing; hearth widened out on both sides of the tuyere and with coal box on one end. Equipped with heavy duty Tuyere iron and with electric variable speed blower with wire and Edison screw plug and six speed regulator.

Mounted on well braced steel pipe legs.

NOS.	Size Hearth, Inches	Type of Hood	Wgt. Each, Lbs.	Each
840	23x30	Windshield	190	$43.00
840-H	23x30	Half-Hood	300	45.00
844-H	31x44	Half-Hood	400	51.00
847-H	32x45	Half-Hood	450	56.00

NO. 844-H has no coal box.

These forges regularly shipped without water tank. If tank is wanted, add $2.00 to list price.

ELECTRIC BLOWERS

CONSTANT SPEED

Will stand up under the severest service.

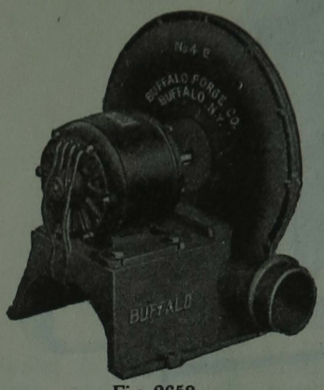


Fig. 2658

Furnished for direct current 110 or 220 volts and for alternating current, 60 cycles, single phase, 110 or 220 volts. Can be operated off polyphase circuit by connecting two wires only. Can be attached to any lamp socket; wire and plug is furnished. No. 4-E requires heavier wiring.

It does not have a speed regulator, but equally efficient control of blast is obtained by means of a sliding blast gate.

Specifications	No. 2-E. 1 Small Fire	No. 2-EH. 1-2 Fires	No.3-E. 2-3 Fires	No.4-E. 3-5 Fires
Wgt., Complete, Lbs.	70	85	100	140
Height Over All, Ins.	15	15	15	20
Dia. of Outlet, Ins..	3	3	4	5
A.C. Motor, Cycles.	60	60	60	60
D.C. Motor R.P.M..	1800	3000	3000	3200
A.C. Motor, R.P.M.	1700	3400	3400	3400
Price with A.C. or D.C. Motor.	**$40.00**	**56.00**	**72.00**	**100.00**

VARIABLE SPEED

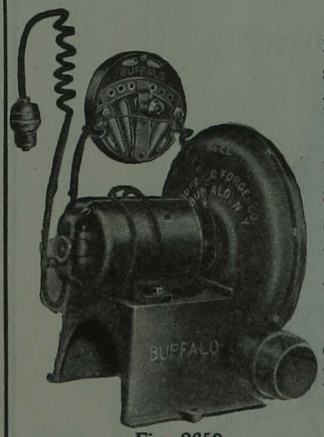


Fig. 2659

Designed primarily for forge fires, but are also used extensively for blowing small furnaces, church organs, etc.

The motor is of such design that it will operate efficiently and satisfactorily on any circuit, either direct or alternating current, single phase 25, 40, 50 or 60-cycle.

The brushes are large and easily accessible through hinged doors. Has oil ring bearings; ball bearings furnished if desired, at same price.

Fifteen feet of wire and plug, and a six-speed regulator are furnished giving six variations of blast.

When ordering, simply state if for 110 or 220 volts.

Variable Speed Motors.	No. 2-E. 1 Average Fire	No. 2-EH. 1 Large or 2 Small Fires	No. 3-E. 3 Small Fires
Weight, Lbs.....	70	85	100
R. P. M.....	2600	3400	3400
Diameter of Outlet, Ins.	3	3	4
Total Height, Ins.....	15	15	15
Each, 110-Volts..... Each, 220-Volts.....	$40.00	56.00	72.00

ELECTRIC FORGES

MACHINISTS'

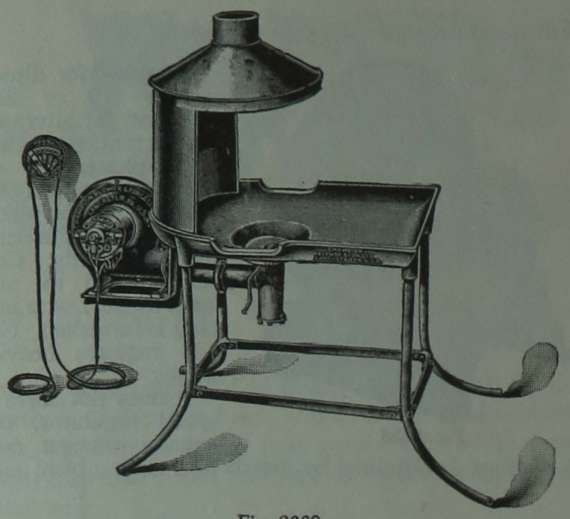


Fig. 2660

Stationary blast forges for shops where a power blast is required. Provided with revolving ball tuyere iron and one fire variable speed electric blower. This blower is very convenient to set up. Rheostat attachment cord and plug furnished with the blower; can be connected to any light socket. Universal motor for both direct and alternating current, either 110 or 220 volts; has six variations of speed; the operator has under his control at all times six different blasts instantly changed from one to the other.

Each

NO. 443—Electric Drive with Ball Tuyere Iron, Hearth, 23x35 Inches; Height, 30 Inches, with Hood Complete; Weight Each, 215 Lbs..... $50.00

BLACKSMITHS'

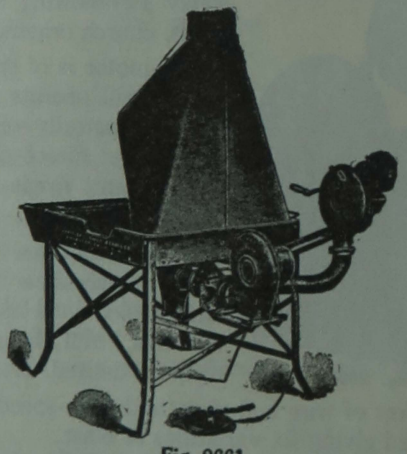


Fig. 2661

Combination hand and electric driven blacksmith steel forge; is furnished with one fire variable speed electric blower, and ball bearing spiral geared steel blower, making a very complete and practical outfit. This combination is particularly suitable in case the electric power is for some reason not at hand; the forge need not remain idle, but can be operated by means of the hand blower, the blast being controlled by a system of blast gates.

Each

NO. 445—Hearth, 30x36 Inches; Height, 30 Inches, With Hood Complete; Weight Each, 350 Lbs. $85.00
Water Tank, Extra..... 5.00

ELECTRIC BLOWERS

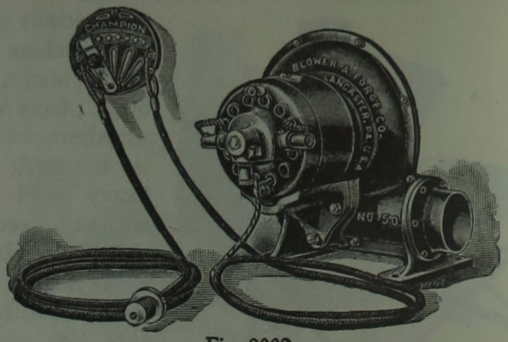


Fig. 2662

For all kinds of general blacksmith work.

One fire, variable speed electric steel pressure blacksmith blower with universal motor for both direct and alternating current, either 110 or 220 volts, with detached rheostat for six speeds; furnished with attachment cord and plug to fit any light socket.

Each

NO. 50—Weight Each, 55 Lbs..... $40.00

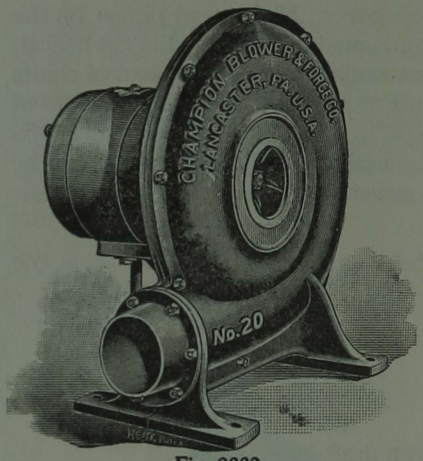


Fig. 2663

DIRECT CONNECTED

A constant speed blower for one or two fires. Special design motor, long and heavy shaft and bearings, supplied with knife switch for starting and stopping the motor.

Each

NO. 20—Height, 15 Inches; 3¼ Inch Diameter of Outlet; Either Direct or Alternating Current, 110 or 220 Volts; Weight Each, 100 Lbs.....$.....

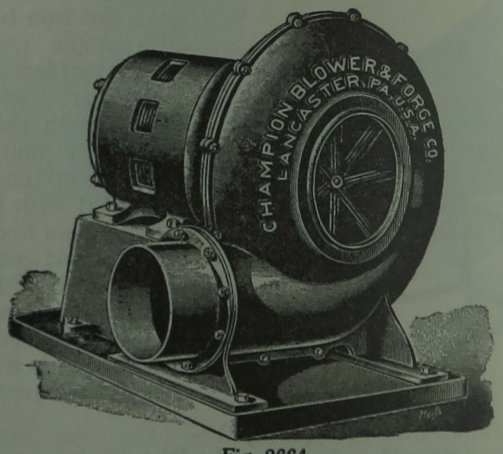


Fig. 2664

Equipped with the most modern type and design of motor. The motor and blower are both placed on the same base, holding them firmly in place.

The blast wheel is attached direct to the motor shaft. The motor is of semi-enclosed type and guaranteed to do the work under continuous service with ordinary care.

Give full information covering requirements, giving current, voltage, phase and cycles of the electric current.

Prices on Application

PRESSURE BLOWERS

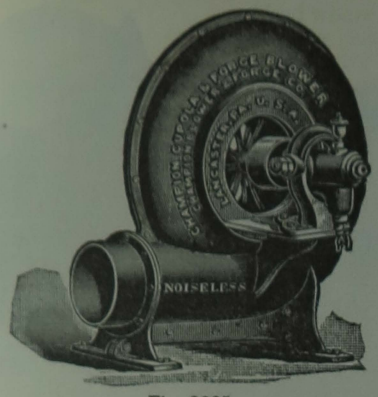


Fig. 2665

Especially adapted for foundry cupolas, furnaces, machine shop forge fires and sand blasts. Produces a stronger blast with same amount of power than any other blower. The journal bearings are thoroughly babbitted and carefully reamed to size; the hammered cast steel shafts, with their long and heavy bearings, are finished with utmost care; journal bearings are universal in adjustment, and are easily lined up with the shaft; being in one solid piece, are easily moved without taking the blower apart; do not allow oil to be thrown out on the belt. A valuable feature connected with journal bearings is the movable drip chamber, which is readily removed and cleaned while the blower is in operation, giving the refuse oil a clean way to the drip cock at all times. Rolled steel plate sides of blast wheel are galvanized; the steel curved blades are riveted to each side plate; spiders are a special composition metal and are extremely tough. Case is of heavy cast iron. When used for cupola blast, all right angles or abrupt turns in blast pipes should be avoided.

NOS.	Height, Inches	Diam. Pulley, Inches	Face Pulley, Inches	Diam. Inside Outlet, Inches	Diam. Inside Cupola, Inches	Melting Capacity per Hour, Lbs.
½	12	1⅞	1⅜	2¾	..	.....
1	15	2½	2	3⅝	..	.....
2	20	3	2⅛	4¼	..	.....
3	24	3⅜	2½	4¾	22	1,300
4	26	3⅞	2¾	5¼	26	2,000
5	30	4½	3⅛	6¼	30	2,900
6	35	4⅞	3½	7½	35	4,000
7	40	5¾	3¾	8¾	40	6,000
8	45	6¾	4½	10¼	46	8,600
9	53	7¾	5½	11⅞	53	12,300
10	64	9	6⅛	13⅞	60	16,500

NOS.	Speed, No. of Rev. for Melting Iron	Pressure of Blast, Ounces	No. of Forge Fires	Rev. per Minute for Forge Fires	Weight Each, Lbs.	Without Counter-shaft, Each
½	.....	..	1	4,300	28	$12.00
1	.....	..	2	4,200	55	18.00
2	.....	..	4	4,000	100	26.00
3	4,150	5	6	3,725	175	36.00
4	3,790	6	9	3,103	240	44.00
5	3,275	7	15	2,456	320	55.00
6	3,050	8	18	2,224	425	70.00
7	2,900	10	24	1,814	575	90.00
8	2,820	12	30	1,619	775	115.00
9	2,600	14	40	1,344	1,000	160.00
10	2,270	15	52	1,200	1,925	225.00

Regularly furnished, right hand bottom horizontal discharge, but will be furnished left hand without extra charge. An extra 10 per cent will be charged for down, upright and top horizontal discharge. Nos. 1 to 3 steel pressure blowers are made with one pulley, Nos. 4 to 10 are made with two pulleys.

FAN BLOWERS

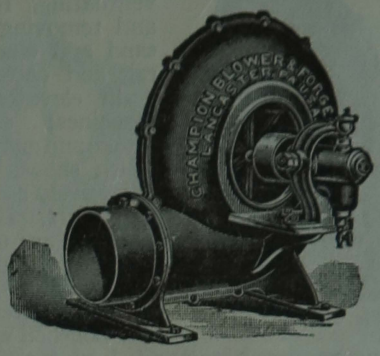


Fig. 2666

Similar in design and construction to the pressure blowers, and are built especially for use where a large volume of blast is required instead of great pressure; adaptable for steam boilers, puddling and heating furnaces, dry rooms, refrigerators, forge fires, etc., also for ventilation. When a blower of full capacity is used, and blast pipes of proper area in proportion to length, two-ounce pressure will be sufficient blast for steam boilers, etc., also for ventilating. Four-ounce pressure with blast pipes in right proportion will give good results on puddling and heating furnaces. Journal bearings are thoroughly babbitted and carefully reamed; hammered cast steel shafts with long and heavy bearings; finished with utmost care and with absolute precision as to size.

Table gives speeds for two and four-ounce of blast per square inch, which meets usual requirements.

NOS.	Height, Inches	Inside Diam. Inlet, Inches	Inside Diam. Outlet, Inches	Diam. Pulley, Inches	Face Pulley, Inches
½	12	4½	3½	2⁹⁄₁₆	1¾
1	15	5	4	3	2
2	18	5¾	4¾	3	2½
3	21½	6½	5¾	3½	2½
4	25½	7½	7½	4¼	3½
5	29¼	9	9	5⅛	4
6	34	10½	10½	6	4¾
7	40	12	12	6¾	5¼
8	45	14	14	8	6½
9	50	16	16	9	8
10	57	18	18	10	9

NOS.	R.P.M. 2-ounce Blast Boiler Fires	R.P.M. 4-ounce Blast Forge Fires	No. of Forge Fires	Sq. Ft. of Boiler Grate Surface Supplied by Blower	Weight Each, Lbs.	Each
½	3,300	4,500	1	4	27	$12.00
1	3,000	4,000	2	6	55	15.00
2	2,600	3,600	4	9	80	20.00
3	2,300	3,200	6	15	125	25.00
4	1,928	2,682	9	24	190	33.00
5	1,638	2,279	15	34	260	44.00
6	1,410	1,961	18	50	350	55.00
7	1,194	1,662	24	72	525	70.00
8	1,018	1,417	30	82	850	90.00
9	878	1,234	40	115	1,150	150.00
10	766	1,065	52	195	1,470	200.00

Regularly furnished, right hand bottom horizontal discharge, but will be furnished left hand without extra charge. An extra 10 per cent will be charged for upright, down and top horizontal discharge.

EXHAUST FANS

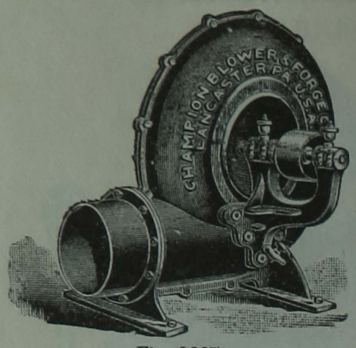


Fig. 2667

Specially adapted for ventilating, refrigerating and removing dust from sand and emery wheels, rag and cotton pickers, grain elevators, buffing machines; exhausting smoke and gas from blacksmith shops, etc. Used extensively by shoe manufacturers. Both journal bearings are on one side, allowing no grit or dust to reach them. Shaft is of hammered steel, turned and polished with utmost care. Table gives speed for 2 and 4 ounces of blast per square inch.

NOS.	Height, Inches	Inside Dia. Inlet, Inches	Inside Dia. Outlet, Inches	Dia. Pulley, Inches	Face Pulley, Inches
½	12	4½	3½	2¼	1½
1	15	5	4	2 5/16	2
2	18	5¾	4¾	3	2½
3	21½	6½	5¾	3½	2½
4	25½	7½	7½	4¼	3½
5	29¼	9	9	5⅛	4
6	34	10½	10½	6	4¾
7	40	12	12	6¾	5¼
8	45	14	14	8	6½
9	50	16	16	9	8
10	57	18	18	10	9

NOS.	R.P.M. 2-ounce Blast for Boiler Fires	R.P.M. 4-ounce Blast for Forge Fires	Weight Each, Lbs.	Each
½	3,300	4,500	28	$12.00
1	3,000	4,000	47	15.00
2	2,600	3,600	68	20.00
3	2,300	3,200	110	25.00
4	1,928	2,682	190	33.00
5	1,638	2,279	280	44.00
6	1,410	1,961	410	55.00
7	1,194	1,662	550	70.00
8	1,018	1,417	900	90.00
9	878	1,234	1,160	150.00
10	766	1,065	1,480	200.00

Regularly furnished, right hand bottom horizontal discharge, but will be furnished left hand, without extra charge. An additional charge of 10 per cent is made for upright or top discharge.

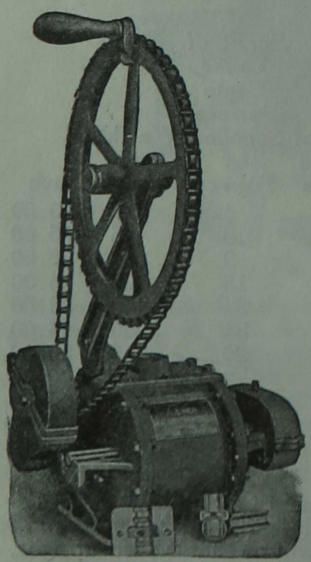


Fig. 2668

POSITIVE HAND BLOWERS

FOR USE WITH FORGES

Easily operated; low pressure handpower positive blower; the gears are cut from solid cast iron blanks and enclosed in an oil-tight housing. The bearings are die cast and can be replaced without dismantling the blower.

Each

NO. 3—Low Pressure; Weight, 115 Lbs. . . $48.50

ROTARY POSITIVE BLOWERS

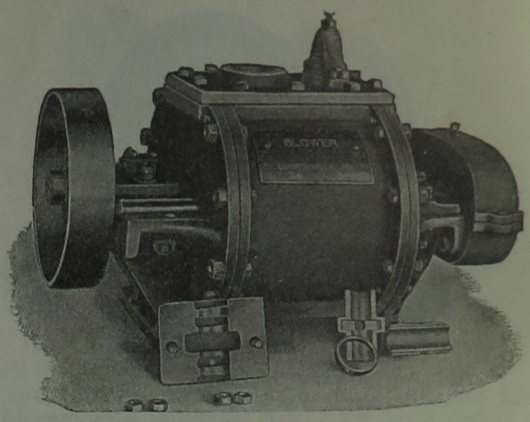


Fig. 2669

These blowers are built in two types, low pressure and high pressure. The low pressure type is used for pressures up to one pound per square inch. High pressure type for pressures above one pound and up to eight pounds per square inch; are of the positive type; the impellers are of close-grained cast iron, machined all over and pressed on steel shafts; die-cast babbitt bearings are interchangeable; are self-oiled by rings from a reservoir in the bottom of the bearing; these replaceable bearings make it unnecessary to have repairs made by an expert; regularly fitted with a relief valve; can be arranged for any form of drive suited to the particular installation. All horizontal machines are constructed for top discharge unless otherwise ordered. The ratings in the table of sizes below are based on a pressure of three pounds per square inch.

LOW PRESSURE BLOWERS

Ratings based on 1 pound per square inch pressure.

NOS.	Vol. per Rev. Cu. Ft.	Maximum Speed R. P. M.	Cu. ft. per Min. at 1 lb.	H.P. at Shaft 1. lb. Press.	Size Outlet, Ins.	Size Pulley, Ins.	Wgt. Lbs.
3	0.1	600	37	0.3	1½	7x1½	100
3½	0.19	550	65	0.5	2½	8x2	175
4	0.34	500	118	0.9	3	10x3	275
4½	0.66	400	213	1.3	4	14x4	500

HIGH PRESSURE BLOWERS

Ratings based on 3 pounds per square inch pressure.

3B	0.05	800	23	0.6	1	7x1½	100
3½B	0.115	700	56	1.15	2	8x2	170
4B	0.205	600	85	1.8	3	10x3	275
4½B	0.333	500	125	2.4	4	14x4	375

NOS.	With Single Pulley	With Pulley and Outboard Bearing	With T. & L. Pulleys	With T. & L. Pulleys and Outboard Bearing
3	$39.50	$42.00	$42.00	$44.50
3½	68.00	72.00	72.00	77.00
4	112.00	117.00	117.00	123.00
4½	215.00	225.00	225.00	235.00

NOS.	With T. & L. Pulleys Outboard Bearing and Belt Shifter	Bedplate Idler, Pulley and Belt Drive	Bedplate Gear and Pinion Direct Drive	Additional Price Bottom Pipeplate to use Blower as Vacuum Pump
3	$46.00	$82.00	$77.00	$2.50
3½	80.00	122.00	120.00	3.00
4	126.00	175.00	167.50	4.00
4½	240.00	290.00	318.00	5.00

List prices are for either High or Low Pressure Blowers.

PRESSURE BLOWERS

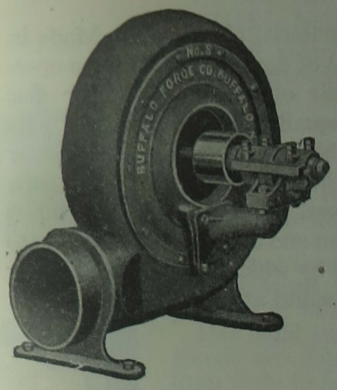


Fig. 2670

Used where pressures not exceeding six ounces are required, as for blowing forge fires, organ blowing, drying or for exhausting smoke, gases or other noxious fumes.

Built with a solid peripheral shell of heavy cast iron, to which side plates of heavy cast iron are fitted tightly and securely bolted. There are no weak putty joints; there is no possibility of leakage. Easy access to the interior for the inspection of parts or making repairs. By removing just one of the side plates, the blast wheel and shaft is readily removed. It is unnecessary to dismantle the machine. The blast wheel is of heavy rolled steel plate, mounted upon a malleable iron spider or hub. The backward turned vanes are securely riveted, not only to the arms of the spider, but also to the heavy steel side flanges. Strength and rigidity are thus assured.

NOS.	Outlet Dia. Outside, Inches	Pulley Diameter, Inches	Pulley Face, Inches	Weight Each, Lbs.	Each
000	5 1/8	2 3/4	2 1/4	45	$23.00
1	4 7/8	3	2 1/2	60	30.00
2	6 1/16	3 1/4	2 5/8	100	38.00
3	7 5/8	4	3	170	54.00
4	9	5	3 7/8	200	66.00
5	10 5/8	5 3/4	4 5/8	275	83.00
6	11 13/16	6 1/2	5 1/4	380	105.00
7	14	7 1/2	6 1/4	575	135.00
8	16 3/8	8 1/2	7 1/4	725	225.00
9	17 7/8	9 1/2	8 1/4	1100	300.00
10	21	12	9 3/4	1600	375.00
11	24 1/2	14	12	3200	525.00

Special discharges 10 per cent additional. In ordering please specify " B " Volume blower or exhauster in full.

PLANING MILL EXHAUSTERS

REVERSIBLE SINGLE FAN

Reversible housing, adjustable to either hand and to any direction of discharge; all adjustments made in a few minutes, and on outside of housing. One fan will meet all requirements, no matter what hand or discharge is required. No necessity for cross belts or sharp angles in piping.

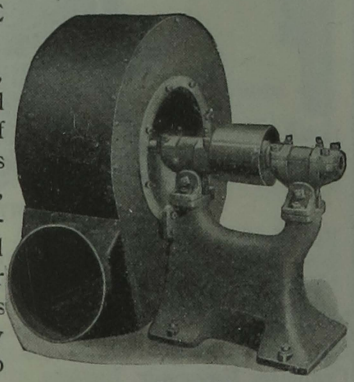


Fig. 2671

NOS.	Outside Dia. Inlet, Inches	Outside Dia. Outlet, Inches	Pulley Dia., Inches	Pulley Face, Inches	Weight Each, Lbs.	Each
25	10	10	5	4	250	$110.00
30	12	12	6	4 1/2	330	125.00
35	14	14	7	5 1/2	420	150.00
40	16	16	8	6 1/2	600	200.00
45	18	18	9	7 1/2	800	250.00
50	20	20	10	8 1/2	900	290.00
55	22	22	11	9 1/2	1200	360.00
60	24	24	12	10 1/2	1600	450.00
70	28	28	14	11 1/2	2200	600.00
80	32	32	16	12 1/2	2800	700.00
90	36	36	18	16 1/2	4500	870.00

ELECTRIC VENTILATING FANS

DISK TYPE

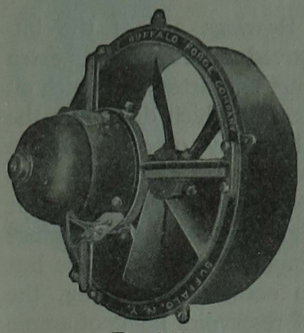


Fig. 2672

Removes noxious fumes, dust, excessive heat and foul air from manufacturing plants, boiler rooms, etc.

Enclosed type motor is secured to the frame of the disk wheel by means of a bracket on the smaller sizes, and by a tripod in sizes from 36 inches and up. No floor space or supports are necessary. It is only necessary to bolt the frame to an opening in the wall or in the window, and connect the wires.

Fitted with motors for direct current, or alternating 1, 2, 3 Phase, 60 cycle.

Voltage of motors, 110 or 220 volts.

Size, Inches	Air per Minute, Cubic Feet	Approx. Weight Complete, Lbs.	Direct Current Speed, R.P.M.	Direct Current Each	Alternating Current Speed, R.P.M.	Alternating Current Each
18	1950	125	1000	$90.00	1120	$110.00
24	4000	200	900	112.50	850	160.00
30	7200	300	800	140.00	850	230.00

N. B.—Starting rheostats are not required.

Fitted with direct current motors only.

Voltage of motors, 110-220 or 500 volts.

Size, Inches	Speed, R. P. M.	Cubic Feet of Air per Minute	Weight Complete, Lbs.	Each
36	525	8150	450	$310.00
42	450	11150	625	410.00
48	400	14600	800	500.00

Prices include starting rheostats. A speed regulator giving up to 50 per cent variation can be furnished at slight additional cost.

PROPELLER TYPE

Propeller fans are used in preference to Disk Fans where the space available for the fan is so small that it becomes a matter of obtaining a fan of the smallest possible dimensions. Its capacity, size for size, is from 25 per cent to 40 per cent greater than that of a disk fan. This higher capacity has been obtained by the peculiar propeller-like design of the blade. The angle and curvature of the blades are correct, causing the air to pass through the fan in a direction parallel to its axis, with uniform velocity throughout the entire area; back flow is impossible, even though the delivery is against pressure.

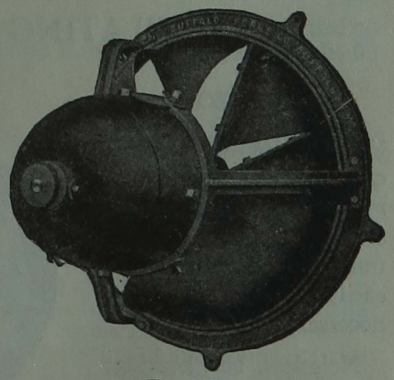


Fig. 2673

Voltage of Motors, 110-220 or 500 volts.

Size, Inches	Speed, R. P. M.	Cubic Feet of Air per Minute	Weight Comp, Lbs.	Each
18	800	2850	200	$162.50
24	650	5120	300	190.00
30	525	8100	450	240.00
36	425	11350	625	372.50

VENTILATING DISK FANS

PULLEY TYPE

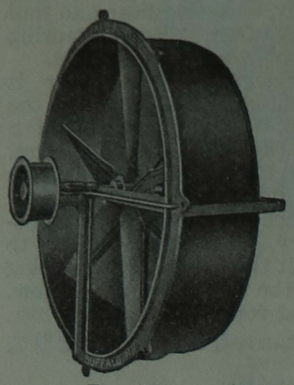


Fig. 2674

Bearings are of the improved oil ring type, extra long, babbitted, and with oil grooves which distribute the oil evenly over the entire wearing surface. With the fan running continuously at high speeds, these bearings remain cool and require but an occasional re-oiling, the oil reservoirs being of ample size with that end in view. Will run smoothly and noiselessly at very high speed without vibration. All sizes up to and including 48 inch diameter are made with the bearings on one side only. Sizes 54 inches and up are overhung pulleys having plain bearings.

Size	Normal Speed R.P.M.	Cu. Ft. Air per Minute	H. P.	Size of Pulley, Inches	Wgt. Each, Lbs.	Each
18	1050	2200	.13	4x2	75	$40.00
24	800	4100	.24	4x2	100	50.00
30	650	6500	.4	6x2¾	170	65.00
36	525	9100	.5	7x3	230	85.00
42	450	12300	.7	8x3⅛	325	110.00
48	400	16300	.95	9x4	445	125.00
54	350	20400	1.2	9x4	560	175.00
60	320	25600	1.5	10x5	630	250.00
72	265	36600	2.1	12x5½	820	300.00
84	225	50500	3.0	14x6	990	350.00

VENTILATING FANS

BREEZO

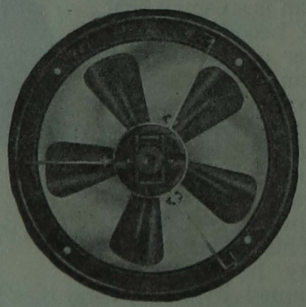


Fig. 2675

Used for Ventilating offices, kitchens, battery rooms, chemical plants or any hot, steamy, close or fume-filled room; can be easily installed, no wiring necessary.

Noiseless, ball bearing; six speeds; Motor is totally enclosed, variable speed, and dust proof; will operate on any 110 or 220 volt circuit, direct or alternating, single phase 25, 30, 40, 50 or 60 cycles; light weight and economical motor supported by a pressed steel tripod which offers minimum resistance to flow of air.

NO.	Fan Dia., Inches	Capacity, Cubic Feet	Speed, R.P.M.	Weight Ea., Lbs.	Each
16	16	1000	500-1000	20	$40.00

FOOT BLOWERS

Constructed of the best material obtainable. Made in two styles and in three sizes of each style. Can be operated anywhere and pure air obtained. A rubber disc forms the air reservoir and equalizes the air pressure by its elasticity. By increasing the number of discs, a greater air pressure is obtained. Blowers can be used for operating blow pipe or melting furnaces. A steady blast of air is obtained at a pressure of from one to nearly two pounds to the square inch. The pedal by which it is operated is low so that operator may sit or stand at pleasure.

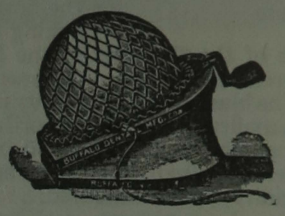


Fig. 2676

NOS.	9	9A	9B
Size Board, Inches	7¾x9	10x11	11½x13¾
Diameter Reservoir, Inches	7¼	9	11
Pressure, per Inch	1	1¼	1¾
Air per Hour, Cubic Feet	190	330	625
Weight Each, Lbs.	6	10	14
Each	$9.50	12.50	17.25

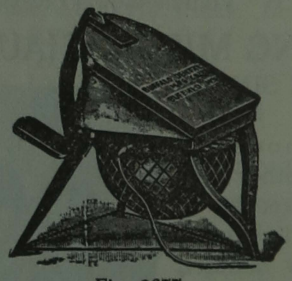


Fig. 2677

With grey iron stand.

NOS.	10	10A	10B
Size Board, Inches	7¾x9	10x11	11½x13¾
Diameter Reservoir, Inches	7¼	9	11
Pressure, per Inch	1	1¼	1¾
Air per Hour, Cubic Feet	190	330	625
Weight Each, Lbs.	9	14	25
Each	$10.75	14.25	19.50

Nos. 9 and 10 are best adapted for ordinary blow pipe work.

Nos. 9A and 10A are employed for larger blow pipes and small melting furnaces.

Nos. 9B and 10B are for use with the largest blow pipes and for melting furnaces up to a capacity of 10 or 12 Lbs. of copper.

POST DRILLS

BALL BEARING

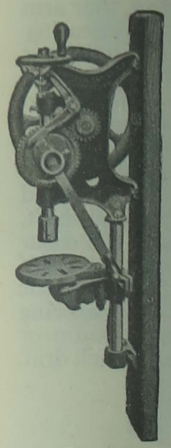


Fig. 2678

Frame is strongly ribbed and will withstand extremely rough handling.

The shaft and spindle are of steel, extra heavy, and carefully finished.

All bearings are bored and reamed in the solid metal of the frame. This insures smooth, easy running.

Gears are machine cut and accurately fitted.

The end thrust of spindle is taken up by two hardened steel balls which take up 90 per cent of all friction at this point.

Has hand and automatic feeds and two speeds are obtained by changing handle from front to back gear.

A slotted table is provided, which can be adjusted to any position—up, down or sideways.

Regularly furnished with "Improved" chuck bored regularly for ½-inch straight shank bit.

Drills to center of 15-inch circle; drills holes up to 1¼ inches; spindle diameter 1⅛ inches; run of feed 3¼ inches; run of table 10½ inches; length over all 38 inches; pulley diameter 6 inches; weight each, 90 lbs.

	Each
NO. 615—For Hand Power only	$10.00
NO. 615-A—For Hand and Power, with Pulleys	13.00

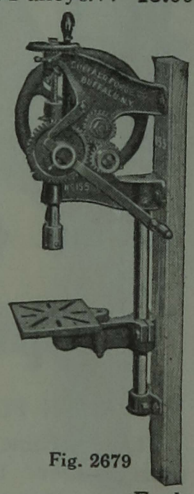


Fig. 2679

Heavy and powerful drill; end thrust taken up by two hardened steel balls between feed screw and spindle; steel shaft and spindle gears of accurate mesh and fit.

Two speeds, change made simply by shifting crank from front to rear gear or back; two feeds, hand and automatic. The small reed wheel is conveniently located at top of feed screw.

Drills to center of 16-inch circle; drills holes up to 1¼ inches; spindle diameter 1⅛ inches; run of feed 3¼ inches; run of table 12 inches; length over all 38 inches; diameter of pulley 6 inches; weight each, 125 lbs.

	Each
NO. 616—For Hand Power only	$13.00
NO. 616-A—For Hand and Power, with Pulleys	16.00

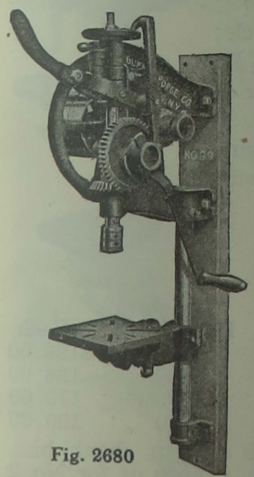


Fig. 2680

A convenient lever feed ball bearing drill; automatic and hand feed; steel balls at end thrust of spindle take up 90 per cent of the friction; has sure grip chuck which enables changing bits without the use of wrench; the round slotted table provided can be raised or lowered or swung out of the way entirely when not wanted.

Drills to center of 15-inch circle; drills holes up to 1¼ inches; spindle 1⅛ inch diameter; run of feed 3 inches; run of table 12 inches; diameter of pulley 6 inches; length over all 40 inches; weight each, 140 lbs.

	Each
NO. 515—For Hand Power only	$18.00
NO. 515-A—For Hand and Power, with Pulleys	21.00

Note.—Spindles bored for ½-inch straight shank bit. On special order, furnished also for ⅝ or 41/64 inch.

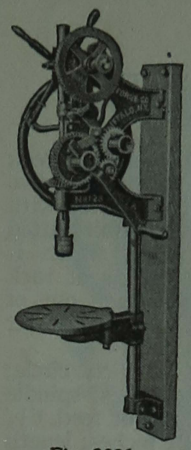


Fig. 2681

POST DRILLS

Frame is heavily ribbed and all bearings bored and reamed from solid metal; a steel ball takes up thrust between feed screw and spindle and eliminates about 90 per cent of the friction; spindle and shaft of polished steel; table slotted and easily moved up, down or sideways; feed can be changed instantly from hand to automatic feed by simply sliding the collar on the feed head; crank can be instantly shifted to the hub of either gear so that two speeds can be obtained. Drills to center of 17-inch circle; drills holes up to 1¼ inches; spindle diameter 1¼ inches; run of feed 5½ inches; run of table 14 inches; length over all 50 inches; pulley size 6 inches by 2¼ inches; weight each, 180 lbs.

	Each
NO. 117—Hand Power only	$20.00
NO. 117-A—With Pulleys	23.00

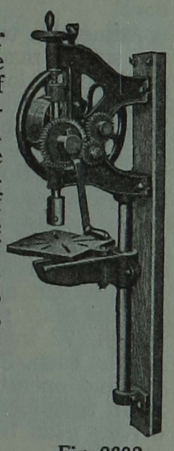


Fig. 2682

Heavy powerful machine suitable for all-round work; shafts and spindles are of steel; steel balls at each end thrust of feed screw relieve 90 per cent of all friction; gears are carefully fitted and mesh perfectly; automatic feed is adjustable to three speeds by turning small adjustment screw; shafts and spindle made of special machine steel; adjustable table can be raised or lowered or swung out of the way entirely when not wanted; furnished with improved chuck. Drills to center of 19-inch circle; drills holes up to 1½ inches; spindle diameter 1¼ inches; run of feed 5 inches; run of table 15 inches; length over all 52 inches; pulley diameter 8 inches; weight each, 220 lbs.

	Each
NO. 619—Hand Power only	$20.00
NO. 619-A—For Hand and Power, with Pulleys	24.00

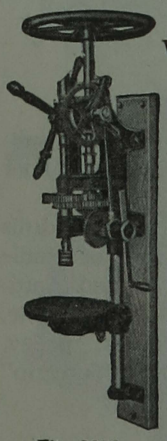


Fig. 2683

WITH UPRIGHT FLY WHEEL SHAFTS

All gears machine cut and guarded; sure grip chuck; no turning back of feed wheel after drilling; the automatic feed has adjustable change of feed or speed by sliding collar; table lowered or raised by turning crank, can also be swung to side; wheel holder furnished with each drill.

Drill to center of 18 and 16-inch circles; drills holes up to 1½ inches; diameter of spindle 1¼ inches; run of feed 5½ inches; run of table, No. 118—17 inches, and No. 116—15 inches. Size of pulleys 8x3 inches; length No. 118, 66 inches, No. 116, 63 inches.

	Each
NO. 118—Hand Operated, Weight Each, 300 lbs.	$36.00
NO. 118-A—Hand and Power	40.00
NO. 116—Hand Operated, Weight Each, 270 lbs.	32.00
NO. 116-A—Hand and Power	36.00

Note.—Chuck bored for ½-inch straight shank bits. Can be bored also for ⅝ or 41/64 inch, or No. 2 Morse Taper

POST DRILLS

WITH UPRIGHT FLY WHEEL SHAFTS

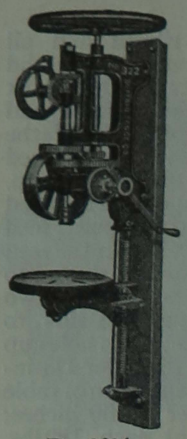


Fig. 2684

All shafts and spindles are of steel; machine cut gears, two feeds, two speeds, ball bearing. Furnished with "Suregrip" chuck. Has carefully fitted slotted round drill table, which is raised or lowered by means of rack and pinion; it can be swung out of the way when desired. A wheel holder is furnished with each drill.

Drills to center of 22 inch circle; drills holes up to 1½ inches; spindle diameter, 1⅜ inches; run of feed, 6¼ inches; run of table, 21 inches; length over all, 66 inches; pulley size, 8x3 inches; shipping weight, 405 lbs.

	Each
NO. 322—Hand Power only	$40.00
NO. 322-A—Hand and Power With Pulleys	44.00

Adjustable to four speeds; spindle has two speeds, machine cut gears with "Suregrip" chuck, locks or releases drill with a half turn of chuck. Multi-compound lever feed is obtained by means of gears. By maintaining a slight pressure on lever, bit is forced through metal with additional speed, resulting in a great saving of time. Adjustable table drills to center of 24 inch circle, drills holes up to 1½ inches. Diameter of spindle, 1¼ inches; gears machine cut and guarded; run of feed, 7½ inches; run of table, 20 inches; length, 72 inches; pulley, 8 x 3 inches; weight each, 390 lbs.

Hand operated, but can be supplied with tight and loose pulleys for belt drive. Has both fast and slow speeds also hand and automatic feeds. Both speeds and feed can be changed at will.

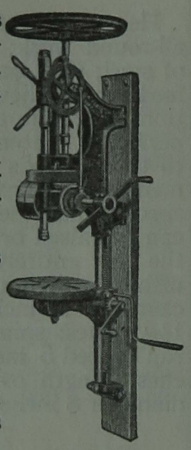


Fig. 2885

	Each
NO. 124—Hand Operated	$50.00
NO. 124-A—Hand and Power With Pulley	54.00

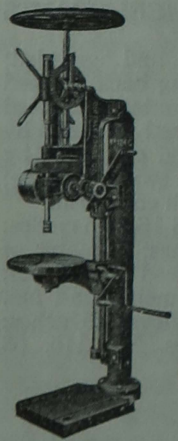


Fig. 2686

WITH FLOOR PLATE

Similar to above but mounted on substantial cast iron column with slotted floor plate.

Drills to center of 21 inch circle; drills holes up to 1½ inches; diameter of spindle 1¼ inches; gears machine cut and guarded; run of feed, 7¼ inches; run of table, 17 inches; length, 75 inches; pulley, 8 x 3 inches; furnished with "Suregrip" chuck. weight each, 550 lbs.

	Each
NO. 121-C—Hand Operated	$55.00
NO. 121-CA—Hand and Power With Pulley	59.00

Note.—Chucks bored for ½ inch straight shank bits. At slight extra cost also for ⅝ or 41/64 inch or for No. 2 Morse Taper.

POST DRILLS

ELECTRIC BALL BEARING

Automatic feed is adjustable to four speeds; spindle has two speeds; all gears machine cut; capstan, four arm lever, hand feed; "Suregrip" chuck, locking or releasing drill with a half turn of chuck. Multi-compound lever feed permits additional forcing of drill bit. This feature is obtained by the strong and simple rack on feed head operated by the four arm levers. By maintaining a light pressure on the latter, the bit is forced through the metal with maximum speed; sliding collar is arranged at feed head for changing from lever to automatic feed or back at will; another is at lower end of fly wheel shaft, for changing from slow to fast speed or back; the collar will slide regardless of position of key, and seat itself automatically. The planetary gears on the automatic feed are the most modern reduction gearing known, being stronger and more simple than the customary worm or screw. Wheel guard and gear guard included with each drill.

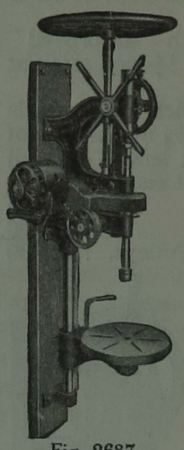


Fig. 2687

To be operated by either ¼ or ½ H. P. electric motor.

Drills to center of 24 inch circle; ¼ H. P. drills holes up to 1¼ inches; ½ H. P. drills holes up to 1½ inches; diameter of spindle 1¼ inches; gears machine cut and guarded; run of feed, 7½ inches; run of table, 20 inches; length over all, 72 inches; furnished with "Suregrip" chuck.

NO. 124-E

Size Motor H. P.	Current	Voltage	Weight Each Lbs.	Each
¼	D.C.	110 or 220	450	$110.00
¼	A.C.	110 or 220	450	121.00
½	D.C.	110 or 220	460	160.00
½	A.C.	110 or 220	460	171.00

WITH FLOOR PLATE

This machine is identically the same as above, but mounted on substantial cast iron column, with heavy floor plate. To be operated by means of an electric motor.

Drills to center of 24 inch circle; ¼ H. P. drills up to 1¼ inches; ½ H. P. drills up to 1½ inches; diameter of spindle, 1¼ inches; run of feed, 8 inches; run of table, 20 inches; height, 78 inches; regularly furnished with slotted base.

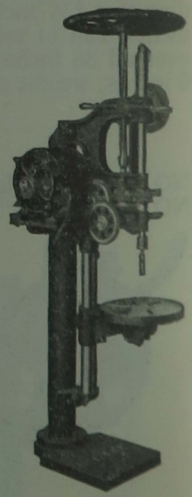


Fig. 2688

NO. 124 CE

H. P. of Motor	Current	Voltage	Weight Each, Lbs.	Each
¼	D.C.	110 or 220	660	$126.00
¼	A.C.	110 or 220	660	136.00
½	D.C	110 or 220	670	170.00
½	A.C.	110 or 220	670	190.00

Note.—Chucks bored for ½-inch straight shank bits. Can also be furnished for 41/64 inch, ⅝ inch or for No. 2 Morse Taper.

When ordering state character of current. Furnished with "Suregrip" chuck.

All A.C. Motors—Single Phase, 60 Cycles

POST DRILLS

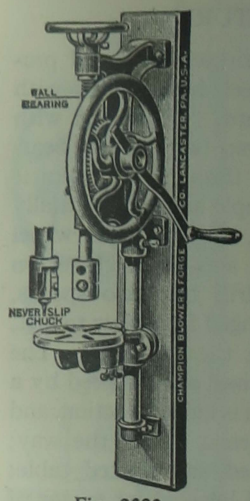


Fig. 2689

HAND FEED

Will drill holes from 0 to ¾ inch and to 12 inch circle. It has a slotted table planed on top; the spindle is made of ⅞-inch steel and has up and down run of 3 inches. The end thrust ball bearings save power and no babbit metal is used in machine bearings. All parts are machined in jigs, and therefore are standard and interchangeable. Spindle bored for ½-inch straight shank drills; heavy balance wheel. Greatest distance from table to spindle, 8 inches.

Each

NO. 92½—Hand Feed; Weight Each, 70 Lbs..... $6.50

AUTOMATIC SELF-FEED

Built to furnish an automatic self-feed drill at the lowest price possible. Has back gears and slotted lathe-turned table. It will drill to the center of a 12-inch circle. It has one speed for the crank. The spindle is ⅞ inch in diameter. It drills holes up to ¾ inch and has an up and down run of 3 inches; the spindle is bored for ½ inch straight shank drills. When specially ordered, will be bored for ⅝ or 41/64 inch, straight shank drills.

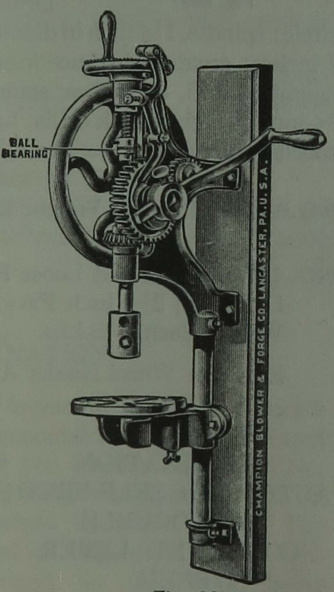


Fig. 2690

Each

NO. 102—Self Feed; Weight Each, 75 Lbs..... $6.50

LEVER FEED

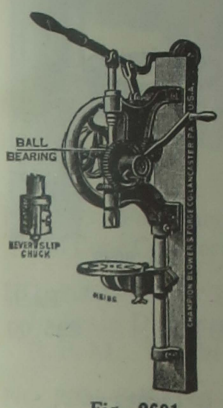


Fig. 2691

Lever feed and back-geared post drill, designed for light and quick work. Is an economical drill for tire drilling and countersinking, especially where screw feed drills are used. Spindle has end thrust ball bearings; drills to the center of 14-inch circle. Drills holes from 0 to ¾ inch; has lathe-turned and slotted table. Spindle, 1 inch diameter; has up and down run of 4½ inches. Greatest distance from table to spindle, 10 inches; height of drill, 40 inches; spindle bored for ½-inch straight shank drills. When specially ordered, will be bored for ⅝ or 41/64 inch.

Each

NO. 100—Lever Feed; Weight Each, 110 Lbs.....$10.00

POST DRILLS

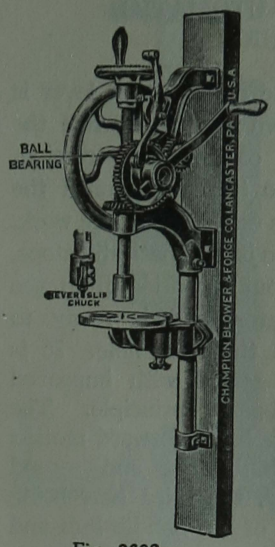


Fig. 2692

AUTOMATIC SELF-FEED

Automatic self-feed; end thrust ball bearings; lathe-turned and slotted table; solid metal, ground spindle bearings. Drills to center of 14-inch circle; drills holes from 0 to 1 inch in diameter. Spindle has up and down run of 3 inches, and is bored for ½ inch straight shank drills. When specially ordered, will be bored for ⅝ or 41/64 inch. End thrust ball bearings save 20 to 50 per cent in power; all machines are jigged, therefore all parts are absolutely standard and interchangeable. Height of drill, 40 inches.

Each

NO. 98—Self-Feed; Weight Each, 100 Lbs..... $8.00

THREE-GEARED

Automatic-self feed; three-geared ball bearing; drill has three gears to give second speed same turning direction of the crank as the first speed; all spindle bearings are cut from solid metal. Lathe turned and slotted table. Spindle, 1⅛ inches in diameter; has up and down run of 3 inches; greatest distance from table to spindle, 10 inches. Height of drill, 46 inches; spindle is bored for ½-inch straight shank drills.

Each

NO. 95—Self-Feed; Weight Each, 120 Lbs.....$11.00

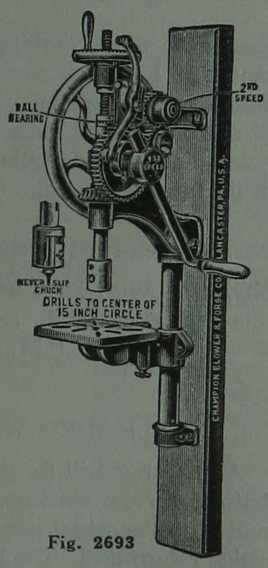


Fig. 2693

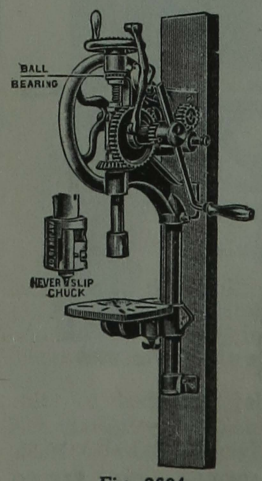


Fig. 2694

TWO SPEEDS

Has three gears to give the second speed the same turning direction of the crank that the first speed has. Drills to the center of a 16-inch circle; the cup and cone of the ball bearings are made from die steel. Ball end thrust bearings on the drill spindle save a large per cent of the power. Has full automatic self-feed; lathe-turned, square slotted table. Spindle is 1¼ inches in diameter with an up and down run of 3 inches. Spindle bored to take ½-inch straight shank drills.

Each

NO. BB—Self-Feed; Weight, 130 Lbs.....$12.50

NO. BBA—With Tight and Loose Pulleys; 6-Inch Diameter; 2-Inch Face; Speed, 250 R.P.M.; Weight, 135 Lbs..... 15.50

POST DRILLS

SELF-FEED WITH AUTOMATIC QUICK RETURN

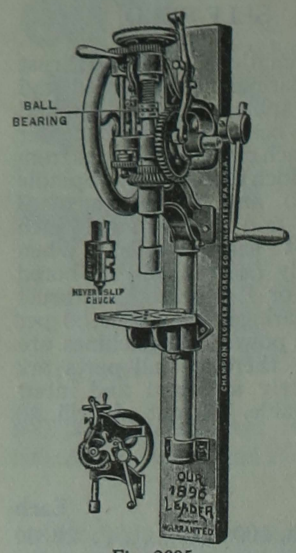


Fig. 2695

The quick return lever is thrown into place while the drill continues in motion, where it remains until the bit is raised out of the work, where it automatically stops, without attention from the operator, and is ready to start the next hole. It is back-geared with improved third-gear principle. The crank has a forward motion on both first and second speed, the third gear being part of the handle hub and only in use as a gear when on the second speed, thus saving the continuous labor of pulling along an intermediate or third gear while working the first speed. Drills to the center of 15½-inch circle. All gears are protected with double journal bearings. Bearings are ground to a working fit out of the solid metal. Will drill from 1/64 to 1¼-inch hole; spindle bored regularly to take ½-inch straight shank drills, furnished to take 41/64-inch on special order.

Each

NO. 96—Self-Feed; Weight Each, 135 Lbs..... $12.50

NO. 96A—With Tight and Loose Pulleys, 6 Inches Diameter, and 2-Inch Face for Power. Speed, 250 R.P.M. Weight Each, 140 Lbs... 15.50

SELF-FEED WITH QUICK RETURN

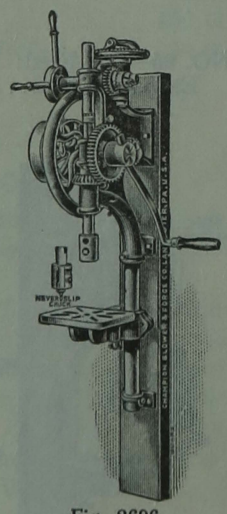


Fig. 2696

A desirable drill for garages and battery service stations. Self-feed and propeller wheel hand feed and quick return drill. The hand wheel and self-feed are independent of each other. For quick work, the hand feed is used and acts as the quick return for the drill bit. Has end thrust ball bearings, and lathe turned and slotted table; all bearings are ground out of solid metal. Drills to center of 16½-inch circle. Drills holes 0 to 1¼ inches. Spindle is 1⅛ inches in diameter; has up and down run of 5½ inches. Greatest distance from table to spindle, 12½ inches; height of drill, 50 inches; spindle bored regularly to take ½-inch straight shank drills; furnished to take 41/64-inch on special order.

Each

NO. 97—Self-Feed; Weight, Each, 175 Lbs..... $18.00

NO. 97—With Tight and Loose Pulleys, 6 Inches in Diameter and 2-Inch Face; Speed, R.P.M; ; Weight Each, 180 Lbs..... 21.00

POST DRILLS

SELF-FEED QUICK RETURN

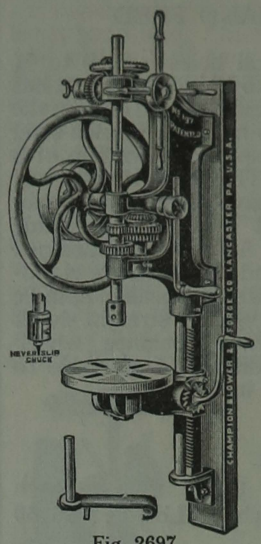


Fig. 2697

Automatic self-feed and propeller wheel hand feed; with quick return. Equipped with back gears; ball thrust bearings used throughout, make it a very simple and substantially built drill. The propeller wheel hand feed acts as quick return for the drill bit; two speeds, easily changed from slow to fast, by sliding the cut gears. The table is raised and lowered by a rack which is quick in action, and can be turned out of the way; lathe-turned and slotted table; raised and lowered by means of crank; all spindle bearings are reamed out of the solid metal. Drills to the center of a 20-inch circle; spindle, 1¼ inch in diameter, has up and down run of 7 inches; greatest distance from table to spindle, 17 inches; height of drill, 68 inches; spindle bored regularly to take ½-inch straight shank drills; furnished to take 41/64 inch on special order.

Each

NO. 197—Self-Feed; Weight Each, 420 Lbs..... $40.00

NO. 197A—Tight and Loose Pulleys, 11 Inches in Diameter; 2½ Inch Face; Speed, 80 R.P.M.; Weight Each, 445 Lbs..... 44.00

Extra for Wheel Holder Attachment..... 2.00

COMBINATION AUTOMATIC SELF-FEED AND DOUBLE COMPOUND LEVER FEED

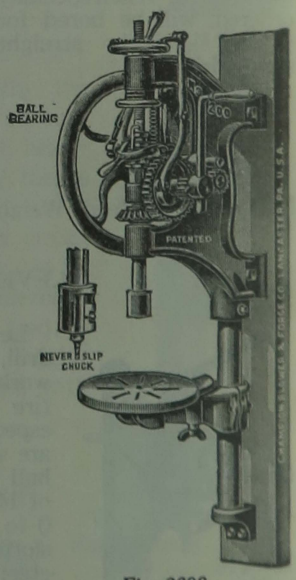


Fig. 2698

Both feeds independent of each other; are instantly changed from one to the other; two speeds with three gears. Ball thrust bearings take all end friction from drill spindle.

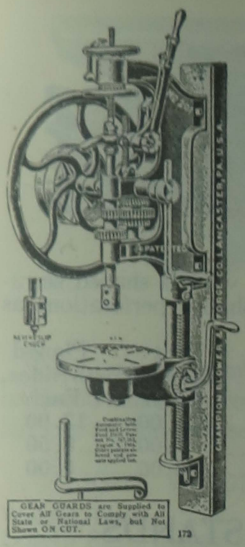
Drills to center of 16-inch circle; drills holes up to 1¼ inch; 1¼-inch spindle has up and down run of 4 inches; spindle bored regularly to take ½-inch straight shank drills.

Each

NO. 200—Self-Feed; Weight Each, 200 Lbs..... $25.00

NO. 200—Tight and Loose Pulleys, 6 Inches in Diameter and 2-Inch Face for Power; Speed, 250 R.P.M.; Weight Each, 205 Lbs..... 28.00

POST DRILLS



[Fig. 2699]

Automatic self-feed and double compound lever feed; cast iron frame, wheels, gears and table; special steel spindle; arranged for two speeds; cut gears can be quickly shifted for fast or slow speed; table is adjustable up and down by means of a crank operated rack and pinion; thrust of drill spindle is taken up by ball bearings; the automatic and lever feeds are independent of each other and change is quickly made from one to the other.

Drills to the center of 21 inch circle; spindle, 1¼ inches diameter; has up and down rim of 5½ inches; greatest distance from table to spindle, 17 inches; height of drill, 68 inches. Drills holes up to 1½ inches; spindle bored regularly to take ½ inch straight shank drills.

	Each
NO. 201—Weight Each, 415 Lbs.	$40.00
NO. 201A—With Tight and Loose Pulleys, 11 Inches in Diameter, 2½ Inch Face for Power. Speed, 100 R. P. M. Weight Each, 440 Lbs.	44.00
Extra for Wheel Holder Attachment	2.00

COMBINATION

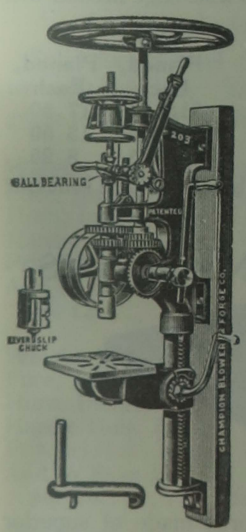


Fig. 2700

Automatic self-feed and double compound lever feed and geared for two speeds; similar to No. 201 above but equipped with an upright fly wheel shaft. The feed on these drills is very convenient for fast work, being arranged for quick return from the drilled hole and quick return back to the work; the compound lever handles large diameter drills. Furnished if specially ordered with wheel hanger for drilling painted wheels; spindle, 1¼ inches in diameter; has up and down run of 5½ inches; drills holes up to 1½ inches and to center of 21 inch circle.

	Each
NO. 203—For Hand or Power, with Cone Pulley and Cone Countershaft. Weight Each, 500 Lbs.	$65.00
NO. 203A—With Tight and Loose Pulleys, 11 Inches in Diameter and 2½ Inch Face; Speed, 80 R. P. M. Weight Each, 425 Lbs.	54.00
NO. 203—Self-Feed—for Hand only. Weight Each, 400 Lbs.	50.00
Extra for Wheel Holder Attachment	2.00

POST DRILLS

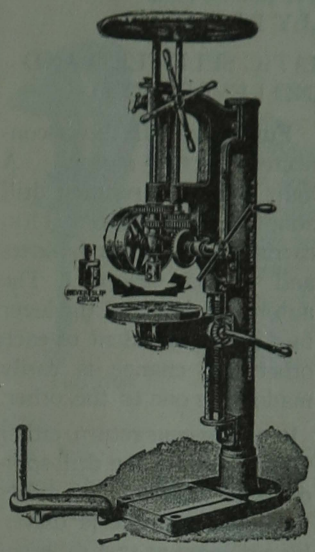


Fig. 2701

An exceptionally high grade, large and powerful quick return drill, equipped with both self-feed and propeller wheel hand feed.

Both feeds are independent of each other.

The upright fly wheel shaft, running on frictionless end thrust ball bearings on its lower end, supports the heavy fly wheel; double back cut gears with two speeds; change from fast to slow speed is accomplished by sliding the gears; the table is raised and lowered by a crank operated rack; end thrust ball bearings; spindle is 1¼ inches in diameter; has up-and-down run of 9 inches. Drills holes up to 1½ inches.

Greatest distance from table to spindle, 19 inches. Height of drill, 72 inches.

Spindle bored to take ⅝ inch or 41/64 inch straight shank bits. If specially ordered will be bored for ½ inch straight shank bits.

Drills to the center of a 24-inch circle.

Pulleys 11 inches in diameter by 2¼ inch face. Should run at 80 R. P. M.

	Each
NO. 397—Complete with Cone Pulley and Countershaft, Weight Each, 750 Lbs.	$80.00
NO. 397A—As above, with Tight and Loose Pulleys, 11 Inch Diameter.	70.00
Extra for Wheel Holder Attachment	2.00

ELECTRICALLY DRIVEN

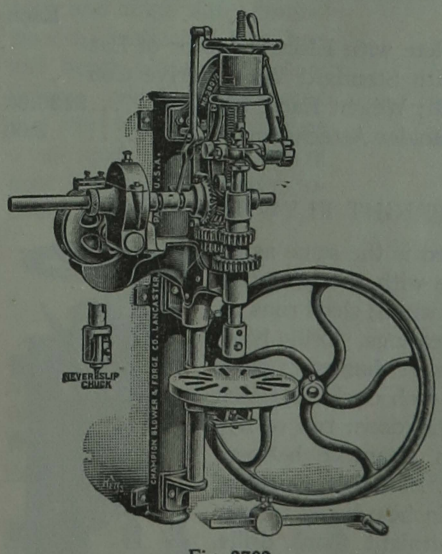


Fig. 2702

Combination Automatic self-feed and double compound lever feed electrically driven upright drill; cut gears, ball bearings; heavy and rigid cast iron post; electric motor with standard worm drive direct connected to the drill. Drive is practically noiseless, powerful and durable; double compound link and oscillating rack and pinion lever feed enables drilling of holes up to 1¼ inches with this drill; Drills to center of 18 inch circle; 1¼ inch spindle with up and down run of 4 inches; is bored regularly to take ½ inch straight shank drills. Greatest distance from table to spindle, 12 inches; height of drill, 55 inches.

	Each
NO. 200½E—Complete with Electric Motor of latest design. Weight Each, 435 Lbs.	$100.00

Note.—When ordering state whether current is direct or alternating.

If direct current, give the voltage only.

If alternating current, give the cycles or alternations, phase and voltage.

POST DRILLS

ELECTRICALLY DRIVEN

COMBINATION AUTOMATIC SELF-FEED AND DOUBLE COMPOUND LEVER FEED

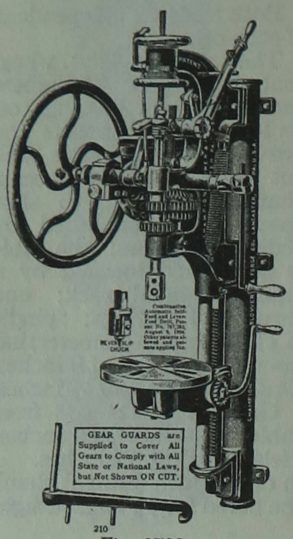


Fig. 2703

Furnished with direct-connected electric motor. A light and quiet running drill adapted for blacksmiths, carriage and wagon builders and railroad shops. The automatic feed and the lever feed are independent of each other and change is easily made from one to the other.

Instantaneous return, either up or down, of the drill spindle is provided for with either feed; drill spindle is driven by cut gears at two different speeds, change being made from one speed to the other by sliding the gears; end thrust of the spindle is taken on ball bearings, all other bearings being reamed from solid metal; table is quickly adjusted up and down by a crank operated rack and pinion.

Drills to center of 21-inch circle; drills holes up to 1½ inches in diameter; 1¼-inch spindle has up and down run of 5½ inches; and is bored regularly to take ½ inch straight shank drills; maximum clearance between table and spindle 17 inches; height of drill over all, 68 inches.

	Each
NO. 201E—Complete with Electric Motor of Latest Design, with Standard Worm Drive Connected to Drill; Weight Each, 500 Lbs.	$130.00
Extra for Wheel Holder Attachment	2.00

WITH UPRIGHT FLYWHEEL SHAFT

Gearing and feed is the same as on drill shown above with the exception of the upright fly wheel; shaft runs on end thrust ball bearings. Drills holes up to 1½ inches in diameter; drills to center of a 21-inch circle; 1¼-inch spindle has up and down run of 5½ inches; maximum clearance between table and spindle, 19 inches; height of drill over all, 72 inches; bored to take ⅝ or 41/64 inch straight shank drills. Height of drill over all, 72 inches.

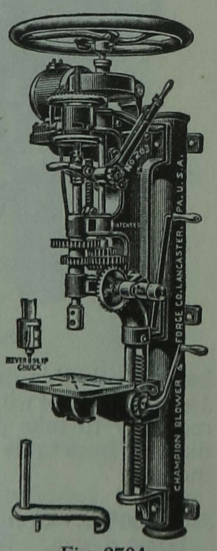


Fig. 2704

	Each
NO. 203E—Complete with Electric Motor; Worm Drive Connected to Drill; Weight Each, 700 Lbs.	$140.00
Extra for Wheel Holder Attachment	2.00

Note.—When ordering, be sure to state whether current is direct or alternating. If direct current, state the voltage only. If alternating current state the cycles or alternations, phase and voltage.

SWAGE BLOCKS

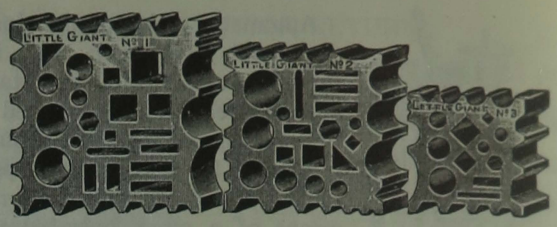


Fig. 2705

Solid cast iron; plain finish with various shaped serrations on edges, and with various shaped perforations as shown.

	Not Planed, Each	Planed Both Sides, Each
NO. 1—18x18x4 Inches	$11.00	13.00
NO. 2—15x15x4 Inches	7.00	8.50
NO. 3—11x11x4 Inches	4.00	5.00

SWAGE BLOCK STANDS

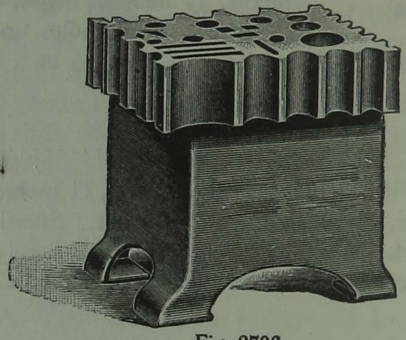


Fig. 2706

We also furnish swage blocks with base as represented above; swage block and base are cast in one piece. When edges are used, base can be tipped so that edge needed will come on upper side.

	Not Planed, Each	Planed, Each
NO. 11—18x18x4x16 High	$15.50	17.50
NO. 12—15x15x4x16 High	12.00	13.50
NO. 13—11x11x4x16 High	7.25	8.25

Unless otherwise ordered, swage blocks will be sent not planed.

CAST IRON LEVELING BLOCKS

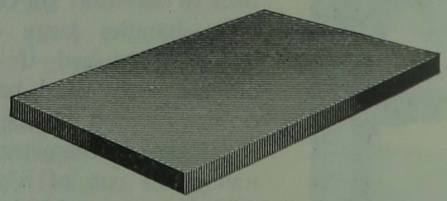


Fig. 2707

Especially intended for plow work; made of superior pig iron and accurately planed on one side, unless otherwise ordered; can furnish either solid or ribbed pattern. The ribbed blocks are cast hollow and therefore weigh light; to ascertain weight of solid blocks, figure one pound to four cubic inches; ribbed blocks weigh about one-third less.

Blocks furnished { 1½ Inches to 5 Inches Thick. 10 Inches to 28 Inches Wide. 12 Inches to 80 Inches Long.

	Per Pound
Solid Pattern Planed on One Side	$.....
Ribbed Pattern, Planed on One Side	.....

Price on Application

ANVILS

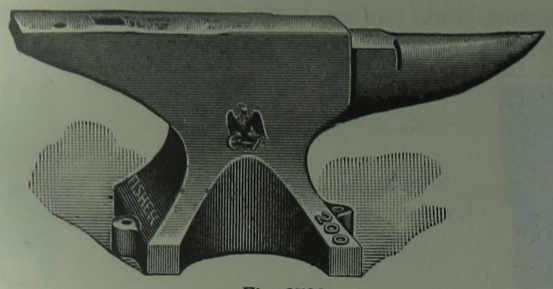


Fig. 2708

EAGLE

Solid iron body and steel horn, japan finished, with hardened and tempered crucible tool steel face welded on; flat ground and polished; square hardy hole.

LIGHT WEIGHT ANVILS OR MINIMS

Weight, Lbs	8	20	30	40	50	60	70
Length Face, Inches	5¾	6¼	7¼	8¾	9¼	10	10½
Width Face, Inches	1¾	2¼	2¼	3	3	3	3¼
Hardie Hole, Inches	⅜	½	½	⅝	⅝	⅝	⅝
Pritchel Hole, Inches	¼	5/16	5/16	7/16	7/16	7/16	½
Length Horn, Inches	3½	4	4	5¼	6½	6½	6½
Extra Over Base, Lb.	$0.20	.08	.05	.03	.02	.01	.00½

	Per Pound Base
Anvils Weighing 80 to 800 Lbs.	$

PETER WRIGHT

The top and bottom of these anvils are solid wrought iron forgings from best selected faggoted scrap iron. The face of tap is heavily steeled with special Sheffield steel and is carefully tempered to stand the greatest wear.

Prices on Application

HAY-BUDDEN

Solid forged steel top welded at the waist to a solid wrought iron base. The entire top being one piece of high grade forged steel, makes it impossible to have a loose face.

Weight, Lbs	40	50	60	70	80
Face, Inches	2¾x9	3x9½	3¼x10	3⅜x11	3½x12
Horn, Inches	6	6½	7	7½	8½
Hardie Hole, Ins.	¾	¾	¾	¾	¾
Pritchel Hole, Ins.	7/16	7/16	7/16	7/16	7/16
Add to Base Price, per Lb.	$0.03	.02	.01	.00½	Base

Weight, Lbs	100	125	150	175	200
Face, Inches	3⅝x13½	3¾x15	4x16½	4¼x17	4½x18
Horn, Inches	9	10	10½	11	11½
Hardie Hole, Ins.	¾	⅞	⅞	1	1⅛
Pritchel Hole, Ins.	7/16	9/16	9/16	9/16	11/16
Add to Base Price, per Lb.	Base	Base	Base	Base	Base

Weight, Lbs	250	300	350	400	450
Face, Inches	4¾x20	5x21	5½x22	6x23	6½x24
Horn, Inches	12½	13	13½	14½	15½
Hardie Hole, Ins.	1⅛	1¼	1¼	1⅜	1⅜
Pritchel Hole, Ins.	11/16	11/16	11/16	11/16	11/16
Add to Base Price, per Lb.	Base	Base	Base	Base	$0.01½

Weight, Lbs	500	600	700	800
Face, Inches	6¾x25	7x26	7½x27	8x28
Horn, Inches	16	17	18	19
Hardie Hole, Inches	1½	1½	1¾	1¾
Pritchel Hole, Inches	13/16	13/16	⅞	⅞
Add to Base Price, per Lb.	$0.01½	0.01½	.02	.02

BLACKSMITH VISES

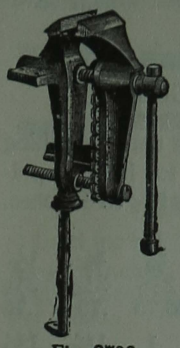


Fig. 2709

FISHER

Double screw parallel chain leg vises; jaws are of the best tool steel, welded on, properly hardened, and of convenient shape for the worker; Equally well for filing or chipping. the solid slide prevents any dropping or twisting of the front jaw, and the threads, being cut in the solid metal of the back jaw, do not give out.

NOS.	2	3	4	5	6
Jaw, Ins.	4½x1	5¼x1⅛	6¼x1¼	7x1½	8x1½
Screw Diam., Ins.	1⅛	1¼	1½	1¾	1⅞
Lever Length, Ins.	13	16	19	24	26
Open, Ins.	5½	6½	7½	9	12
Weight Each, Lbs.	65	90	120	160	210
Each	$12.00	16.00	20.50	27.00	35.00

SOLID BOX VISES

Fig. 2710

DIAMOND HOLDFAST

Highest grade forged steel body and hinge plate; ground smooth; malleable iron box and bench plate; dull black finish; polished tempered tool steel inserted jaws; steel screw and polished sliding lever handle; steel spring between jaws.

NOS.	25	30
Width Jaw, Ins.	3⅜	3½
Weight each, lbs.	25	30
Each	$12.00	11.00

NOS.	35	50	60
Width Jaw, Ins.	4	4¼	4½
Weight each, lbs.	35	50	60
Each	$10.00	11.50	13.00

NOS	70	80	90
Width Jaw, Ins.	5	5¼	5½
Weight each, lbs.	70	80	90
Each	$15.00	17.40	20.00

NOS	100	150	200
Width Jaw, Ins.	6	7	8
Weight each, lbs.	100	150	200
Each	$22.00	36.00	56.00

BLACKSMITHS' TOOLS

Highest grade tool steel, black japanned finish; hardened faces or cutting edges.

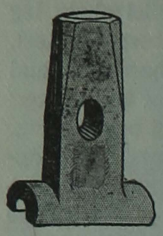


Fig. 2711

TOP SWAGES

Used for shaping, sizing and smoothing round forgings; oval eye for handle; polished rounding bit; lengths 5½ to 6 inches.

Size, Inches	¼	⅜	½
Weight Each, Lbs.	2½	2½	2½
Each	$0.75	.75	.75

Size, Inches	⅝	¾	⅞	1	1⅛	1¼
Weight Each, Lbs.	2½	3¼	3¼	3¼	3¾	3¾
Each	$0.85	1.00	1.00	1.00	1.15	1.15

Size, Inches	1⅜	1½	1¾	2	2½	3
Weight Each, Lbs.	3¾	4¼	4¾	4¾	5½	5½
Each	$1.30	1.30	1.45	1.45	1.75	1.95

BOTTOM SWAGES

Used for shaping, sizing and smoothing round forgings; for 1 inch anvil hole; length, 4 to 4½ inches.

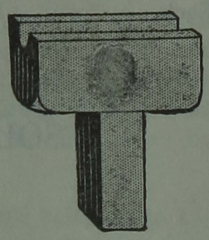


Fig. 2712

Size, Inches	¼	⅜	½
Weight Each, Lbs.	2	2	2½
Each	$0.75	.75	.75

Size, Inches	⅝	¾	⅞	1	1⅛	1¼
Weight Each, Lbs.	2½	2½	2½	3	3	3
Each	$0.85	1.00	1.00	1.00	1.15	1.15

Size, Inches	1⅜	1½	1¾	2	2½	3
Weight Each, Lbs.	3½	3½	4	4½	5½	5½
Each	$1.30	1.30	1.45	1.45	1.75	1.95

TOP FULLERS

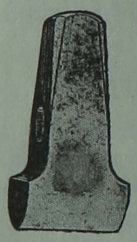


Fig. 2713

Used for necking and grooving forgings, and also for drawing down a forging to a smaller section. Oval eye for handle; polished bit; length, 6 to 6½ inches.

Size, Inches	¼	⅜	½	⅝
Weight Each, Lbs.	2½	2¾	2¾	2¾
Each	$0.75	.85	.85	.85

Size, Inches	¾	⅞	1	1¼	1½	1¾	2
Weight Each, Lbs.	2¾	3	3	3½	3½	4	4½
Each	$0.85	1.00	1.00	1.05	1.20	1.30	1.45

BOTTOM FULLERS

Used for necking and grooving forgings, and also for drawing down a forging to a smaller section; for 1 inch anvil hole; length, 4½ to 5 inches.

Fig. 2714

Size, Inches	¼	⅜	½	⅝	¾	⅞
Weight Each, Lbs.	2¼	2¼	2¼	2½	2½	2½
Each	$0.75	.85	.85	.85	.85	1.00

Size, Inches	1	1¼	1½	1¾	2
Weight Each, Lbs.	2½	3½	3½	4	4½
Each	$1.00	1.05	1.20	1.30	1.45

BLACKSMITHS' TOOLS

Highest grade tool steel, black japanned finish; hardened faces or cutting edges.

Fig. 2715

HARDIES

Sets in the anvil and is used for cutting off hot forgings; polished bit; square shank.

Size Shank, Inches	½	⅝	¾	⅞	1	1⅛	1¼
Width Bit, Inches	1⅝	1⅝	1⅞	2	2¼	2¼	2½
Weight Each, Lbs.	⅝	1	1¼	1¾	2	2½	2¾
Each	$0.40	.40	.45	.55	.60	.75	.85

FLATTERS

For smoothing and finishing flat forgings. No bottom tool is required, the anvil serving as such; oval eye for handle; square polished face.

Fig. 2716

Square Face, Ins.	1½	2	2½	2¾	3	3½	4
Weight each, Lbs.	1	2	3¼	3½	4½	6	8
Each	$0.75	.90	1.20	1.35	1.50	2.10	3.00

SET HAMMERS

Fig. 2717

For setting down the metal in a forging to form a square corner at a point where the section changes; oval eye for handle; square polished face.

Size Face, Inches	1	1¼	1½	1¾	2
Weight Each, Lbs.	1	2	3¼	4½	5½
Each	$0.60	.75	1.00	1.20	1.50

ROUND PUNCHES

Oval eye for handle.

Fig. 2718

Diameter Point, Inches	¼	⅜	½
Length Over All, Inches	7⅛	7¼	7½
Weight Each, Lbs.	1¾	1¾	2
Each	$0.60	.60	.60

Diameter Point, Inches	⅝	¾	⅞	1
Length Over All, Inches	7	8	7⅛	7⅜
Weight Each, Lbs.	2	2½	2½	3½
Each	$0.75	.85	.90	1.05

SQUARE PUNCHES

Fig. 2719

Oval eye for handle.

Size Square, Inches	¼	⅜	½
Length Over All, Inches	7⅜	6¾	6¾
Weight Each, Lbs.	2	2	2
Each	$0.60	.60	.60

Size Square, Inches	⅝	¾	⅞	1
Length Over All, Inches	6	6⅝	6½	6⅞
Weight Each, Lbs.	2	2¾	3	3½
Each	$0.75	.85	.90	1.05

BLACKSMITHS' TOOLS

High-grade tool steel; black japanned finish; hardened faces or cutting edges.

Fig. 2720

COLD CUTTING CHISELS

For cutting cold iron or steel; polished bit and head; oval eye for handle.

Stock at Eye, Inches	**1**	**1⅛**	**1¼**	**1⅜**
Length, Inches	4⅞	5¼	5⅞	6⅛
Weight Each, Lbs.	1	1½	2	2½
Each	**$0.45**	**.55**	**.60**	**.75**
Stock at Eye, Inches	**1½**	**1⅝**	**1¾**	**2**
Length, Inches	6¼	6⅞	7⅜	7⅜
Weight Each, Lbs.	3	4	5	6
Each	**$0.90**	**1.20**	**1.50**	**1.80**

HOT CUTTING CHISELS

For cutting hot iron or steel; polished bit and head; oval eye for handle.

Fig. 2721

Stock at Eye, Inches	**1**	**1⅛**	**1¼**	**1⅜**
Length, Inches	6	6¾	7⅜	7¾
Weight Each, Lbs.	1	1½	2	2½
Each	**$0.45**	**.55**	**.60**	**.75**
Stock at Eye, Inches	**1½**	**1⅝**	**1¾**	**2**
Length, Inches	8¼	9	9¾	10¼
Weight Each, Lbs.	3	4	5	6
Each	**$0.90**	**1.20**	**1.50**	**1.80**

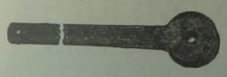


Fig. 2722

HEADING TOOLS

Used for holding bolts while forming the head.

Size Hole, Inches	**¼**	**⅜**	**½**	**⅝**	**¾**	**⅞**	**1**
Length, Inches	15	15	15	15	18½	18½	18½
Weight Each, Lbs.	3	3	3	3	4½	4½	4¾
Each	**$1.00**	**1.00**	**1.00**	**1.30**	**1.30**	**1.50**	**1.50**

MANDRELS

Solid cast iron; Flattened on one side to permit work to be grasped firmly with tongs; have square bases, which keep them from being so easily tipped over; when ordering, mention the number of mandrel wanted.

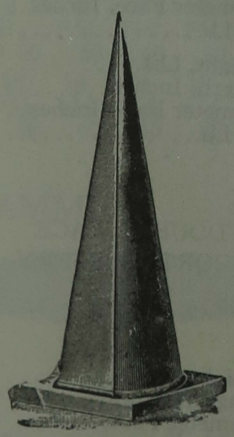


Fig. 2723

NOS.	**1**	**2**	**3**	**4**
Size Base, Inches	10	10	12	16
Height, Inches	36	46	48	62
Each	**$6.00**	**7.75**	**11.00**	**16.00**

BLACKSMITHS' TOOLS

Solid drop forged crucible steel; oil finish.

Fig. 2724

STRAIGHT LIP TONGS

Used for holding thin flat work.

Length, Inches	**14**	**16**	**18**	**20**	**22**	**24**	**30**
Wgt. per doz. Lbs.	27	30	33	35	38	40	48
Per Dozen	**$6.90**	**7.20**	**7.50**	**7.95**	**8.55**	**9.60**	**11.40**

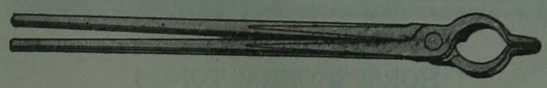


Fig. 2725

CURVED LIP, FLUTED JAW TONGS

Used for holding bolts or other round work. The opening between the jaws and the hinge allows ample space for the head of a bolt.

Length, Inches	**18**	**20**	**20**	**22**
To Hold Rounds, Inches	¼	⅜	½	⅝
Weight per Dozen, Lbs.	32	34	34	37
Per Dozen	**$9.00**	**9.75**	**9.75**	**11.25**
Length, Inches	**22**	**24**	**24**	**26**
To Hold Rounds, Inches	¾	⅞	1	1½
Weight per Dozen, Lbs.	37	39	39	42
Per Dozen	**$11.25**	**12.75**	**12.75**	**14.25**

Fig. 2726

DOUBLE PICK UP TONGS

Used for picking up hot work, either flat or round.

Length, Inches	**18**	**20**	**22**	**24**
Weight per Dozen, Lbs.	31	33	36	38
Per Dozen	**$12.00**	**12.75**	**13.50**	**15.00**

Fig. 2727

SINGLE PICK UP TONGS

For picking up hot work of any form. The jaws are larger than those of the double pick up tongs and consequently will handle heavier work.

Length, Inches	**18**	**20**	**22**	**24**
Weight per Dozen, Lbs.	31	33	36	38
Per Dozen	**$12.00**	**12.75**	**13.50**	**15.00**

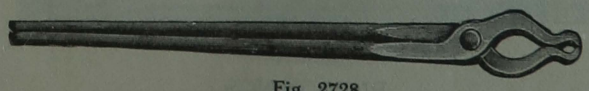


Fig. 2728

RIVET TONGS

Used for handling hot rivets.

Length, Inches	**18**	**20**	**22**	**24**
Weight per Dozen, Lbs.	31	33	36	38
Per Dozen	**$24.00**	**25.50**	**27.75**	**30.00**

BLACKSMITHS' TOOLS

Solid drop forged wrought steel; oil finish.

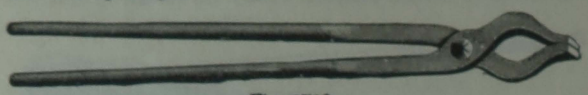


Fig. 2729

GAD TONGS

Flat jaws, for general forging purposes.

Length, Inches	18	20	22	24
Weight per Dozen, Lbs.	31	33	36	38
Per Dozen	$9.00	9.75	11.25	12.75

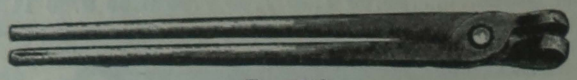


Fig. 2730

HORSESHOERS' TONGS

Used extensively by farriers; are recessed on the inside of the face, which gives them good holding power.

Length, Inches	12	14	16
Weight per Dozen, Lbs.	11	14	15½
Per Dozen	$7.20	7.80	8.25

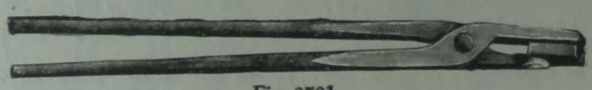


Fig. 2731

LATHE TOOL TONGS

For holding bar stock when forging lathe tools.

Length, Inches	18	20	22	24
Weight per Dozen, Lbs.	32	34	37	39
Per Dozen	$24.00	25.50	27.75	30.00

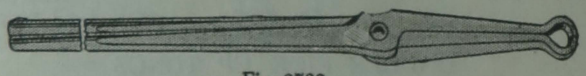


Fig. 2732

BRIDGE BUILDERS' RIVET TONGS

Length, Inches	30
Weight Each, Lbs.	3⅞
Each	$1.50

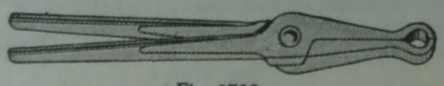


Fig. 2733

PASSING TONGS

Used for chain welding and as punch holder.

Length, Inches	12
Weight Each, Lbs.	2⅞
Each	$1.35

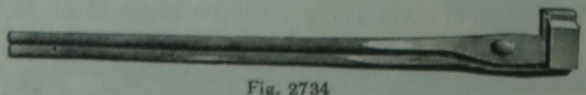


Fig. 2734

PICK TONGS

Principally used for holding miners' picks while being sharpened.

Length, Inches	22
Weight per Dozen, Lbs.	38
Per Dozen	$16.20

BLACKSMITHS' SLEDGES

Solid crucible tool steel; oil finish; hardened and polished faces.

DOUBLE FACE REGULAR PATTERN

Fig. 2735

Weight, Lbs.	2	3	4	5	6
Length, Inches	6	6	6¼	6¼	6¼
Diameter Face, Inches	2	2	2	2	2
Per Lb.	$0.50	.40	.40	.30	.30

Weight, Lbs.	7	8	9	10	12
Length, Inches	6½	6¾	6¾	6¾	6¾
Diameter Face, Inches	2¼	2¼	2¼	2¼	2¼
Per Lb.	$0.30	.30	.30	.30	.30

Weight, Lbs.	14	16	18	20
Length, Inches	7⅞	7⅞	7⅞	7⅞
Diameter Face, Inches	2⅝	2⅝	2⅝	2⅝
Per Lb.	$0.30	.30	.30	.30

STRAIGHT PEIN REGULAR PATTERN

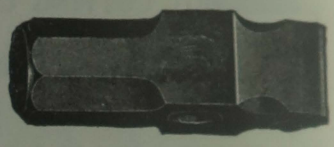
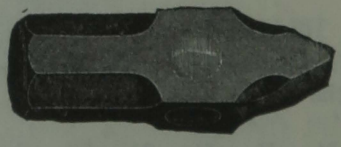


Fig. 2736

Weight, Lbs.	5	6	8	10
Length, Inches	6¾	6¾	7	8⅛
Diameter Face, Inches	2	2	2¼	2¾
Per Lb.	$0.30	.30	.30	.30

Weight, Lbs.	12	14	16	20
Length, Inches	8⅛	8⅛	8⅛	8½
Diameter Face, Inches	2¾	2¾	2¾	3
Per Lb.	$0.30	.30	.30	.30



CROSS PEIN REGULAR PATTERN

Fig. 2737

Weight, Lbs.	5	6	8	10
Length, Inches	6¾	6¾	7	7
Diameter Face, Inches	2¼	2¼	2½	2½
Per Lb.	$0.30	.30	.30	.30

Weight, Lbs.	12	14	16	20
Length, Inches	7	7	8⅛	8⅛
Diameter Face, Inches	2½	2½	2¾	2¾
Per Lb.	$0.30	.30	.30	.30

DOUBLE FACE SHORT PATTERN

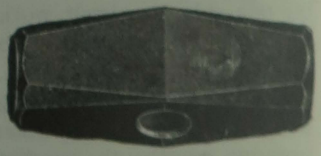


Fig. 2738

Weight, Lbs.	2	3	4	5	6	7
Length, Inches	4⅞	4⅞	4⅞	6¼	6¼	6¼
Diameter Face, Inches	1⅝	1⅝	1⅝	2	2	2
Per Lb.	$0.50	.40	.40	.30	.30	.30

Weight, Lbs.	8	10	12	14	16
Length, Inches	6¼	6¼	6½	7¼	7¼
Diameter Face, Inches	2	2⅜	2⅝	2 11/16	2 11/16
Per Lb.	$0.30	.30	.30	.30	.30

STRIKING OR DRILLING SLEDGES

DOUBLE FACE LONG PATTERN

Fig. 2739

Light sizes are extensively used as anvil hand hammers by blacksmiths; heavier sizes for rock drilling and general shop and contractors' usage.

Weight, Lbs.	3	3½	4	5
Length, Inches	6⅛	6⅛	6⅛	7⅜
Diameter Face, Inches	1½	1½	1½	1⅞
Per Lb.	$0.40	.40	.30	.30
Weight, Lbs.	**6**	**7**	**8**	**9**
Length, Inches	7⅜	7⅜	7⅜	8½
Diameter Face, Inches	1⅞	1⅞	1⅞	2⅜
Per Lb.	$0.30	.30	.30	.30
Weight, Lbs.	**10**	**12**	**14**	**16**
Length, Inches	8½	8½	8½	8½
Diameter Face, Inches	2⅜	2⅜	2⅜	2⅜
Per Lb.	$0.30	.30	.30	.30

STONE SLEDGES

Solid crucible tool steel; oil finish; hardened and polished faces.

Used for breaking stone not only among quarries, but as a convenient sledge for farm use.

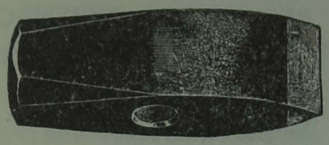


Fig. 2740

Weight, Lbs.	8	10	12	14
Length, Inches	7⅛	7⅛	7⅛	7⅛
Diameter Face, Inches	2	2	2	2
Per Lb.	$0.30	.30	.30	.30
Weight, Lbs.	**16**	**18**	**20**	**24**
Length, Inches	8⅝	8⅝	8⅝	8⅝
Diameter Face, Inches	2⅞	2⅞	2⅞	-⅞
Per Lb.	$0.30	.30	.30	.30

SPAULING OR STONE HAMMERS

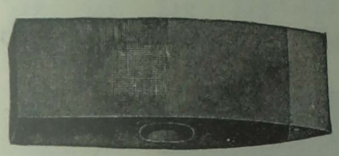


Fig. 2741

Solid crucible tool steel; oil finish; hardened and polished faces.

These hammers are used for dressing stones.

Weight, Lbs.	3	4	5	6	8
Length, Inches	6⅛	6⅛	7⅜	7⅜	7⅜
Per Lb.	$0.50	.50	.40	.40	.40
Weight, Lbs.	**10**	**12**	**14**	**16**	**18**	**20**
Length, Inches	8½	8½	8½	9⅞	9⅞	9⅞
Per Lb.	$0.40	.40	.40	.40	.40	.40

NAPPING HAMMERS

Used for breaking up stone in connection with road work.

Fig. 2742

Weight, Lbs.	1	1½	2
Length, Inches	5	5	5¼
Diameter Face, Inches	¾	¾	¾
Per Lb.	$0.50	.50	.50
Weight, Lbs.	**2½**	**3**	**4**	**5**
Length, Inches	5¼	5¼	6½	6½
Diameter Face, Inches	⅞	⅞	1¼	1¼
Per Lb.	$0.50	.40	.40	.30

HAND DRILLING HAMMERS

CALIFORNIA PATTERN

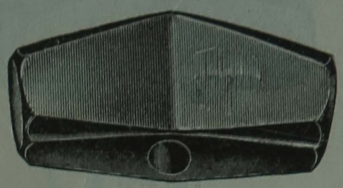


Fig. 2743

Intended for one-hand blows on drills or stone cutters' tools, and are specially shaped to give the desired balance for such work.

Solid crucible tool steel; oil finish; hardened and polished faces.

Weight, Lbs.	3	3½	4
Length, Inches	5½	5½	5⅝
Diameter Face, Inches	1¼	1¼	1⅜
Per Lb.	$0.50	.50	.50

BUSH HAMMERS

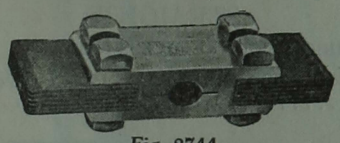


Fig. 2744

Cuts rest on a hardened steel gib, which construction produces an unusually lively working hammer. All cuts are made of the best tool steel obtainable.

NOS.	1	2
Opening, Inch	15/16 or 1	13/16 or ⅞
Cuts per End	4 or 5	6
Weight, Lbs.	10½ & 11	9 & 9½
Each	$5.50	5.50
NOS.	**3**	**4**	**5**
Opening, Inch	¾ or 13/16	⅝ or 11/16	9/16 or ⅝
Cuts per End	8	10	12
Weight, Lbs.	7 & 7½	6 & 6½	4½ & 5
Each	$5.25	5.00	5.00

New Cuts, per Set (Both Ends), Any No. $1.50
Extra Bolts, per Dozen ..... .75

RAILROAD TRACK MAULS

Fig. 2745

Solid crucible tool steel; oil finish; hardened and tempered; polished faces.

Weight, Lbs.	5	6	7	8	9	10
Length, Inches	9½	9½	9½	10½	10½	11¼
Diameter Face, Inches	1	1	1	1⅛	1⅛	1¼
Per Lb.	$0.30	.30	.30	.30	.30	.30

TRACK CHISELS

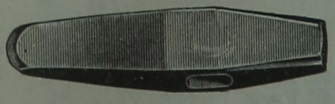


Fig. 2746

Solid crucible tool steel; oil finish; hardened polished face; tempered cutting edge.

Weight, Lbs.	4½	5	6
Length, Inches	8	8⅝	8¾
Width Bit, Inches	1 3/16	1¼	1¼
Per Lb.	$1.35	1.50	1.80

BRIDGE BUILDERS' DOLLIES'

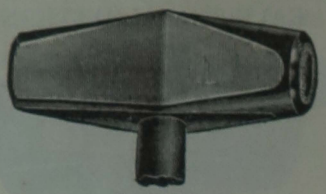


Fig. 2747

SPRING TYPE

Best quality steel; Used for riveting; 15-pound head; 1¼-inch round iron handle, 8 feet long.

For Rivets, Size, Inches	¾	⅞	1
Each	....	....	....

DOLLY BARS

Fig. 2748

STRAIGHT

2⅛-inch round steel; 30 Inches long.

For Rivets, Size, Inches	¾	⅞	1
Each	....	....	....

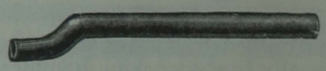


Fig. 2749

OFFSET

2⅛-inch round steel; 30 inches long.

For Rivets, Size, Inches	¾	⅞	1
Each	....	....	....

All Above, Prices on Application

BOILER PICKS

Fig. 2750

Solid crucible tool steel; oil finish.

Weight, Lbs.	1
Length, Inches	5
Width of Bits, Inches	1 3/16
Each	$0.75

SHIP OR TOP MAULS

Fig. 2751

Solid crucible tool steel; oil finish; hardened and polished face.

Weight, Lbs.	4	4½	5	5½
Length, Inches	8¼	8¼	8¾	8¾
Diameter Small Face, Inches	⅜	⅜	7/16	7/16
Diameter Large Face, Inches	1¾	1¾	1⅞	1⅞
Per Lb.	$0.42	.42	.42	.42

Weight, Lbs.	6	7	8
Length, Inches	9	9	9
Diameter Small Face, Inches	½	½	½
Diameter Large Face, Inches	2⅛	2⅛	2⅛
Per Lb.	$0.42	.42	.42

STRUCTURAL IRON WORKERS' TOOLS

Fig. 2752

BUTTON HEAD RIVET SETS

Best quality refined steel; oval eye.

For Rivets, Inches	⅜	½	⅝	¾
Diameter Cup, Inches	¾	⅞	1⅛	1¼
Length, Inches	6¼	6¼	7	7
Weight Each, Lbs.	3½	3½	5½	5½
Each	$2.70	2.70	3.95	3.95

Fig. 2753

SIDE CHISELS

Best quality steel; for cutting cold steel.

Length, Inches	8
Width of Bit, Inches	1⅝
Weight Each, Lbs.	4½
Each	$2.15

Fig. 2754

BACK-OUT PUNCHES

Best quality steel; oval eye.

Diameter Face, Inches	⅜	½	⅝	¾	⅞
Length, Inches	7½	8½	8½	8¾	8¾
Weight Each, Lbs.	1½	2½	2½	2¾	3½
Each	$0.70	1.20	1.20	1.30	1.70

Fig. 2755

SHIP OR BRIDGE BUILDERS' RIVETING HAMMERS

Best quality steel; oval eye; black finish.

Length, Inches	9
Diameter Face, Inches	1
Weight Each, Lbs.	4
Each	$1.90

Fig. 2756

DRIFT PINS

Best quality steel; used for aligning and enlarging bolt and rivet holes.

Diameter, Inches	9/16	11/16	13/16	15/16	1 1/16
Length, Inches	6½	6¾	7⅞	7⅞	8
Weight Each, Ounces	5	8	13	18	22
Each	$0.30	.30	.30	.35	.55

MACHINISTS' HAMMERS

Solid crucible cast steel, perfectly tempered; polished selected second growth hickory handles.

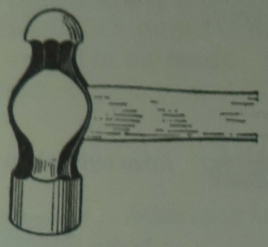


Fig. 2757

BALL PEIN

Octagon pattern; polished and hardened head and pein. Black neck.

NOS.	306	307	308	309	310
Size	00000	0000	000	00	0
Length Over All, Inches	10 7/8	12	13	14	14 1/2
Quantity in Box, Dozen	1/2	1/2	1/2	1/2	1/2
Weight Each, Lbs.	1/4	3/8	1/2	3/4	1
Each	$1.35	1.35	1.35	1.35	1.40

NOS.	311	312	313	314	316	318
Size	1	2	3	4	6	8
Length Over All, Inches	15	16	16	16	16	16
Quantity in Box, Dozen	1/2	1/2	1/2	1/2	1/3	1/3
Weight Each, Lbs.	1 1/4	1 1/2	1 3/4	2	2 1/2	3
Each	$1.50	1.60	1.75	1.85	2.15	2.50

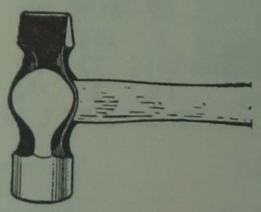


Fig. 2758

STRAIGHT PEIN

Octagon pattern, hardened and polished head and pein. Black neck.

NOS.	330	331	332	333	334
Size	0	1	2	3	4
Length Over All, Inches	14 1/2	15	16	16	16
Quantity in Box, Dozen	1/2	1/2	1/2	1/2	1/2
Weight Each, Lbs.	1 1/4	1 1/2	1 3/4	2	2 1/4
Each	$1.70	1.85	1.95	2.10	2.25

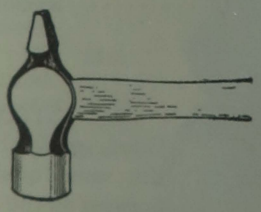


Fig. 2759

CROSS PEIN

Octagon pattern; hardened and polished head and pein. Black neck.

NOS.	350	351	352	353	354
Size	0	1	2	3	4
Length Over All, Inches	14 1/2	15	16	16	16
Quantity in Box, Dozen	1/2	1/2	1/2	1/2	1/2
Weight Each, Lbs.	1	1 1/4	1 1/2	1 3/4	2
Each	$1.70	1.85	1.95	2.10	2.25

HAND HAMMERS

Solid crucible cast steel; perfectly tempered; polished selected second growth hickory handles.

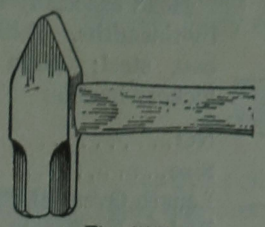


Fig. 2760

ENGINEERS'

Plain eye; octagon bevel; full polished; hardened pein

NOS.	380	381	382	383	384
Size	0	1	2	3	4
Length Over All, Inches	14	15	16	16	16
Quantity in Box, Dozen	1/2	1/2	1/2	1/3	1/3
Weight Each, Lbs.	1 1/8	1 5/8	2	2 1/2	3
Each	$1.65	1.80	1.95	2.10	2.20

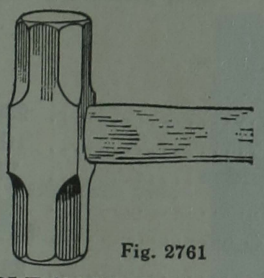


Fig. 2761

DOUBLE FACE ENGINEERS'

Plain eye; octagon bevel; full polished; hardened pein.

NOS.	392	393
Size	2	3
Length Over All, Inches	16	16
Quantity in Box; Dozen	1/3	1/3
Weight, Each Lbs.	2 3/8	3
Each	$2.30	2.50

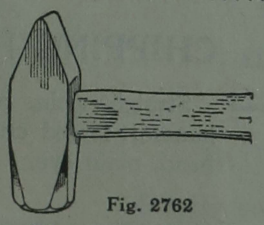


Fig. 2762

BLACKSMITHS'

Plain eye; full polished; hardened pein.

NOS.	400	401	402	403	404
Size	0	1	2	3	4
Length Over All, Inches	15	16	16	16	16
Quantity in Box, Dozen	1/2	1/3	1/3	1/3	1/6
Weight Each, Lbs.	1 5/8	2	2 5/8	3	3 1/2
Each	$1.80	1.95	2.10	2.20	2.35

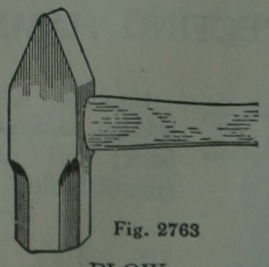


Fig. 2763

PLOW

Round face; especially adapted for use in sharpening plow irons. Cross pein, full polished, hardened pein.

NOS.	410	411	412
Size	0	1	2
Length Over All, Inches	14	15	16
Quantity in Box, Dozen	1/2	1/2	1/3
Weight Each, Lbs.	1 1/8	1 5/8	2
Each	$1.65	1.80	1.95

RIVETING HAMMERS

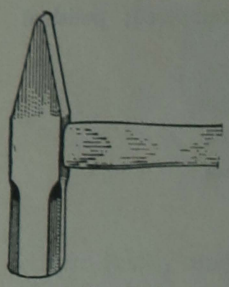


Fig. 2764

TINNERS'

Head especially designed for use by tinsmiths. Solid forged crucible cast steel; plain eye; polished hickory handle.

NO	462
Size	2
Length Over All, Inches	13
Weight Each, Lbs	¾
Each	**$1.30**

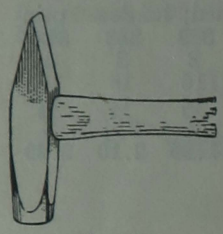


Fig. 2765

Used for ordinary riveting. Forged crucible cast steel, plain eye; polished hickory handle.

NOS.	230	231	232
Size	0	1	2
Length Over All, Inches	11	12	13
Weight Each, Lbs	¼	7/16	⅝
Each	**$1.20**	**1.25**	**1.30**
NOS	233	234	235
Size	3	4	5
Length Over All, Inches	13	14	14
Weight Each, Lbs	⅝	1	1⅛
Each	**$1.35**	**1.40**	**1.55**

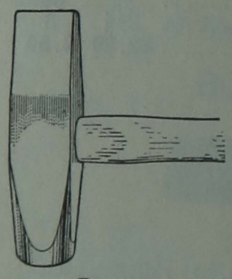


Fig. 2766

CHIPPING HAMMERS

Straight pein, polished hickory handle; forged crucible cast steel head, plain eye.

NOS.	431	432	433
Size	1	2	3
Length Over All, Inches	14	15½	16
Weight Each, Lbs	1½	2	2½
Each	**$1.95**	**2.10**	**2.25**

PROSPECTING HAMMERS

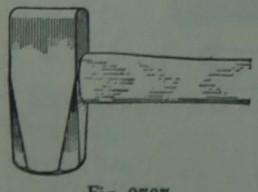


Fig. 2767

Crucible tool steel; round octagon face; straight rounding back; full polished; second growth hickory handle.

NO	262
Size	2
Length Over All, Inches	15
Quantity in Box, Dozen	½
Weight Each, Lbs	1¾
Each	**$2.60**

All Above, One-half Dozen in a Box

NAIL HAMMERS

Forged from solid crucible steel; hardened faces; tempered claws; handles all white clear, straight grained, second growth hickory.

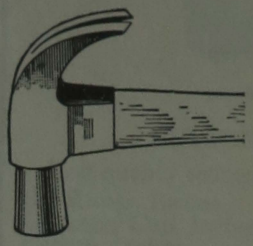


Fig. 2768

Adze eye; plain face.

NOS.	40	41	41½	42	43	44
Size	0	1	1½	2	3	4
Length Over All, Inches	15	13½	13	13	12	12
Weight Each, Lbs	1¾	1¼	1	13/16	7/16	5/16
Each	**$2.05**	**1.95**	**1.85**	**1.75**	**1.65**	**1.55**

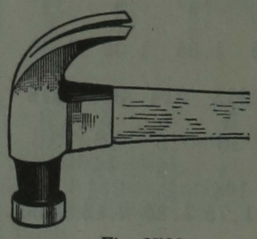


Fig. 2769

Adze eye; bell face; black neck.

NOS.	51	51½	52	52½	53	54
Size	1	1½	2	2½	3	4
Length Over All, Inches	13½	13	13	12½	12	12
Weight Each, Lbs	1¼	1	13/16	⅝	7/16	5/16
Each	**$1.95**	**1.85**	**1.75**	**1.70**	**1.65**	**1.55**

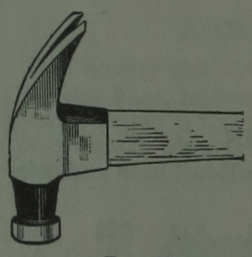


Fig. 2770

Adze eye; bell face; straight claw.

NOS.	51A	51½A
Size	1	1½
Length Over All, Inches	13½	13
Weight Each, Lbs	1¼	1
Each	**$1.95**	**1.85**

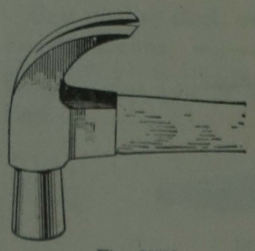


Fig. 2771

STANDARD

Good, serviceable tool, but not of the same quality or as highly finished as the above.

NO	91½
Size Inches	1½
Length Over All, Inches	13
Weight Each, Lbs	1
Each	**$1.60**

All Above, One-half Dozen in a Box
Weights given do not include handle

HATCHETS

Made from the best grade of steel with thin blades for fast cutting and large, full face for driving. Blade beneath eye heat treated to give it toughness so it will not bend or break. Handles are turned from selected hickory and are securely wedged in the heads. Weights given do not include handles.

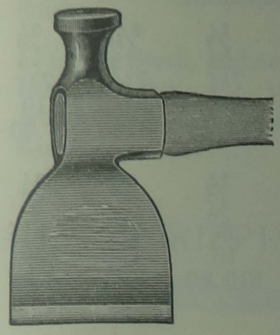


Fig 2772

SHINGLING

Adze eye; bell poll; full polished.

NO	520
Size	1
Width Bit, Inches	3⅜
Weight per Dozen, Lbs.	12
Per Dozen	**$27.00**

HALF

Adze eye; bell poll; full polished.

NOS.	530	531
Size	1	2
Width Bit, Inches	3⅛	3⅜
Wgt. per Doz., Lbs.	10	14
Per Dozen	**$27.00**	**27.00**

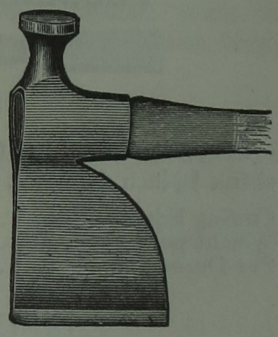


Fig. 2773

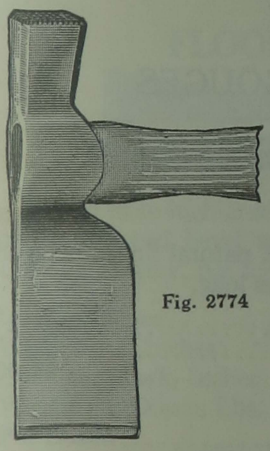


Fig. 2774

LATHING

Philadelphia Pattern

Thin, neat design with square scored head.

NO.	570
Width Bit, Inches	2
Weight per Dozen, Lbs.	7½
Per Dozen	**$28.00**

BROAD

Regular Pattern Single Bevel

Square poll; plain face; polished and bronzed.

Of high-grade steel with blades tapered for fast cutting. Handles are turned from second growth hickory. Well balanced and affords a comfortable and firm grip. Polished and bronzed. Weights given do not include handles.

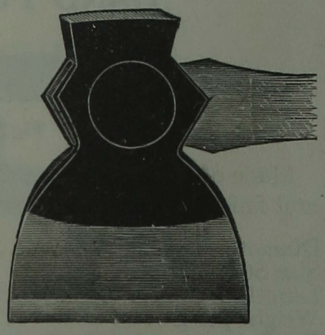


Fig. 2775

NOS.	640	641	642	643	644
Size	1	2	3	4	5
Width Bit, Inches	4	4½	5	5½	6
Weight per Dozen, Lbs.	18	21	26	30	35
Per Dozen	**$24.00**	**24.00**	**30.00**	**30.00**	**36.00**

All Above, One-half Dozen in a Box

HATCHETS

Forged from a high-grade steel. Blades are tapered for fast cutting. Handles are turned from carefully selected second growth hickory and insure hand comfort and a sure grip. Well balanced. Weights given do not include the handles.

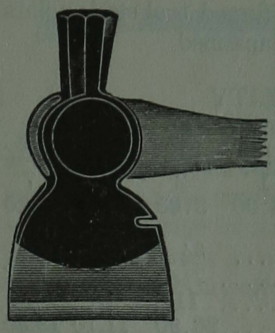


Fig. 2776

SHINGLING

Octagon poll; plain face; polished and bronzed.

NOS.	591	592
Size	1	2
Width Bit, Inches	3½	4
Wt. per Doz., Lbs.	13	19
Per Dozen	**$18.00**	**18.00**

HALF

Octagon poll; plain face; polished and bronzed.

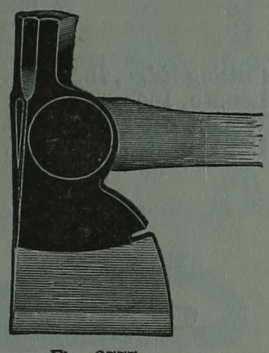


Fig. 2777

NOS.	600	601	602
Size	1	2	3
Width Bit, Inches	3¼	3⅝	4
Weight per Dozen, Lbs.	11	15	20
Per Dozen	**$18.00**	**18.00**	**21.00**

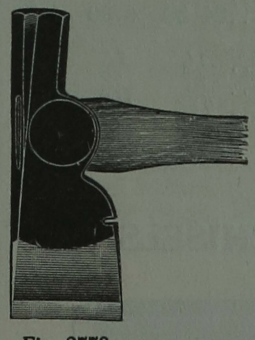


Fig. 2778

LATHING

Octagon poll; plain face; polished and bronzed.

NOS.	621	622
Size	1	2
Width Bit, Inches	2¼	2½
Wt. per Doz., Lbs.	10	14
Per Dozen	**$18.00**	**18.00**

CLAW

Square poll; plain face; polished and bronzed.

NOS.	610	611
Size	1	2
Width Bit, Inches	3½	4
Wt. per Doz., Lbs.	15	16
Per Dozen	**$18.00**	**21.00**

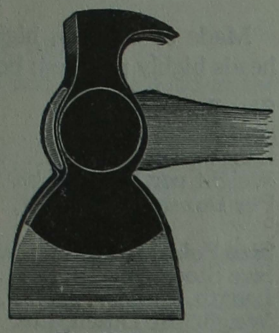


Fig. 2779

All Above, One-half Dozen in a Box

COLD CHISELS

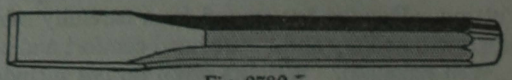


Fig. 2780

Made of octagon, high-grade forged tool steel; points and heads highly polished; body japanned.

EXTRA QUALITY

Cutting Edge, Inches	1/4	3/8	1/2	5/8
Length, Inches	5	5 1/2	6	6 1/2
Weight per Dozen, Lbs.	1	2	4	7
Per Dozen	$3.00	3.60	3.60	4.20

Cutting Edge, Inches	3/4	7/8	1
Length, Inches	7 1/2	8	8 1/2
Weight per Dozen, Lbs.	11	18	22
Per Dozen	$6.90	11.10	13.50

EXTRA LONG
BLACK FINISH

Cutting Edge, Inches	3/4	3/4	3/4
Length, Inches	12	18	24
Weight per Dozen, Lbs.	19	30	....
Per Dozen	$6.00	8.20	10.50

CAPE CHISELS

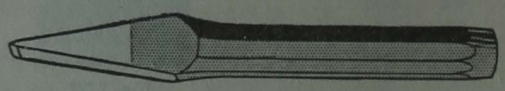


Fig. 2781

Made of octagon high-grade forged tool steel; points and heads highly polished; body japanned.

Cutting Edge, Inches	1/4	5/16	3/8
Size Stock, Inches	1/2	1/2	5/8
Length, Inches	7	7	7
Weight per Dozen, Lbs.	6	6	6 1/2
Per Dozen	$4.30	4.30	4.70

Cutting Edge, Inches	1/2	5/8	3/4
Size Stock, Inches	3/4	7/8	1
Length, Inches	7 1/2	7 1/2	7 1/2
Weight per Dozen, Lbs.	9 1/2	10	13 1/4
Per Dozen	$6.85	7.20	9.55

ROUND NOSE CHISELS

Fig. 2782

Made of octagon, high-grade forged steel; points and heads highly polished; body japanned.

Size Point, Inches	1/4	5/16	3/8
Size Stock, Inches	1/2	1/2	5/8
Length, Inches	6 3/4	7	7
Weight per Dozen, Lbs.	5 3/4	6	6
Per Dozen	$4.15	4.39	4.30

Size Point, Inches	1/2	5/8	3/4
Size Stock, Inches	3/4	7/8	1
Length, Inches	7 1/4	7 1/2	8
Weight per Dozen, Lbs.	9 1/4	10 1/4	14
Per Dozen	$6.65	7.49	10.00

All Above, One-half Dozen in a Box

DIAMOND POINT CHISELS

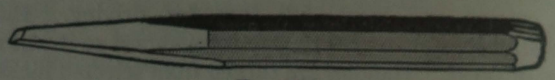


Fig. 2783

Made of octagon, high-grade forged tool steel; points and heads highly polished; body japanned.

Size Point, Inches	1/4	5/16	3/8
Size Stock, Inches	1/2	1/2	5/8
Length, Inches	7 1/4	7 1/4	7 3/4
Weight per Dozen, Lbs.	6 3/4	6 3/4	10
Per Dozen	$4.85	4.85	7.20

Size Point, Inches	1/2	5/8	3/4
Size Stock, Inches	3/4	7/8	1
Length, Inches	8	8 1/4	8 1/2
Weight per Dozen, Lbs.	15	16 1/4	20 3/4
Per Dozen	$10.80	11.70	14.95

PLUMBERS' CHISELS

Fig. 2784

Forged tool steel; oil tempered; natural finish; octagon shank 5/8-inch diameter; 11 inches long.

Cutting Edge, Inches	3/4	7/8	1	1 1/4	1 1/2
Weight per Dozen, Lbs.	7	9	11	13	15
Per Dozen	$4.40	4.80	5.20	6.00	7.00

PLUMBERS' GOUGES

Fig. 2785

Forged tool steel, oil tempered, natural finish, octagon shank, 5/8-inch diameter; 11 inches long.

Cutting Edge, Inches	1
Weight per Dozen, Lbs.	11
Per Dozen	$8.00

HAND PUNCHES

Fig. 2786

Made of high-grade forged tool steel, oil tempered, natural finish; considerably heavier than machine punches.

Diameter Point, Inches	1/32	1/16	1/8
Size Stock, Inches	5/8	5/8	5/8
Length, Inches	6	6 1/2	7 1/2
Weight per Dozen, Lbs.	2	4	7
Per Dozen	$1.65	1.90	3.35

Diameter Point, Inches	3/16	1/4	5/16
Size Stock, Inches	3/4	7/8	1
Length, Inches	8 1/4	8 3/4	9 1/4
Weight per Dozen, Lbs.	10	16	21
Per Dozen	$4.20	6.30	8.80

All Above, One-half Dozen in a Box

STONE CUTTERS' CHISELS

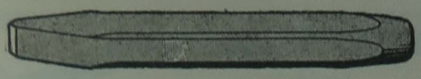


Fig. 2787

Made of best grade octagon tool steel; tempered and oil finish.

Diameter Stock, Inches	7/8
Length, Inches	9
Weight Each, Lbs.	1 3/4
Each	**$0.50**

RIPPING CHISELS

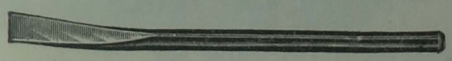


Fig. 2788

Forged from high-grade hexagon crucible steel; oil tempered; polished bevel and head; natural finish body. Used for prying, etc.

Length, Inches	14	18
Width Face, Inches	1 1/2	1 1/2
Diameter Stock, Inches	3/4	3/4
Weight per Dozen, Lbs.	21	27
Per Dozen	**$8.80**	**9.60**

FLOOR CHISELS

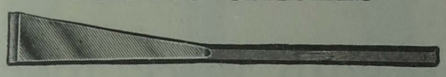


Fig. 2789

Forged from high-grade hexagon crucible steel; oil tempered; polished bevel and head; natural finished body. Used for cutting; not for prying.

Length, Inches	14	18
Width Face, Inches	2 1/2	2 1/2
Diameter Stock, Inches	3/4	3/4
Weight per Dozen, Lbs.	21	21
Per Dozen	**$10.50**	**13.20**

BRICK CHISELS

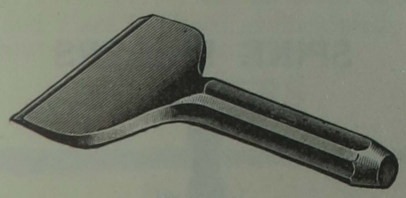


Fig. 2790

Forged tool steel; oil tempered; natural finish; shank 3/4 inch diameter; single bevel blade.

Cutting Edge, Inches	3	3 3/4	4	4 1/2
Length Over All, Inches	6	6 1/2	7	7 1/2
Weight per Dozen, Lbs.	13	15	17	19
Per Dozen	**$8.00**	**9.60**	**10.80**	**12.50**

All Above, One-half Dozen in a Box

WRECKING BARS

Forged from highest grade hexagon tool steel; carefully oil tempered and hardened. Made to stand up under the hardest service.

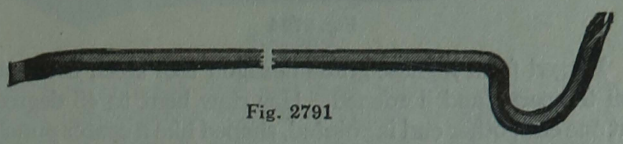


Fig. 2791

GOOSE NECK

Used by wreckers, contractors, roofers and for other all-around work; the curve of the bar at the claw gives tremendous leverage in starting stubborn nails; the goose neck permits work in corners and out of the way places where other bars are often useless.

NOS.	**306**	**307**	**308**	**309**
Length, Inches	12	15	18	24
Size Steel, Inches	1/2	5/8	5/8	3/4
Weight per Dozen, Lbs.	12 3/4	22 1/2	25 1/2	45
Per Dozen	**$10.50**	**12.00**	**12.70**	**15.00**

NOS.	**310**	**311**	**312**
Length, Inches	30	36	42
Size Steel, Inches	3/4	7/8	7/8
Weight per Dozen, Lbs.	55	88	100
Per Dozen	**$16.00**	**20.00**	**25.00**

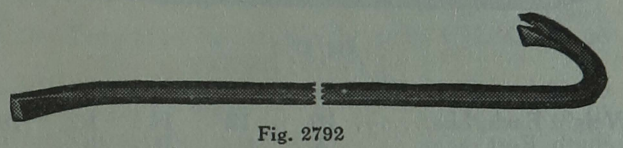


Fig. 2792

THREE-QUARTER BEND

Combines the various good features of the goose neck bar, differing only in the bend. Used for all-around work; very popular shape.

NOS.	**313**	**314**	**315**	**316**
Length, Inches	12	15	18	24
Size Steel, Inches	1/2	5/8	5/8	3/4
Weight per Dozen, Lbs.	12 1/2	22 1/2	25 1/2	45
Per Dozen	**$10.00**	**11.40**	**12.00**	**14.00**

NOS.	**317**	**318**	**319**
Length, Inches	30	36	42
Size Steel, Inches	3/4	7/8	7/8
Weight per Dozen, Lbs.	55	88	100
Per Dozen	**$15.00**	**19.00**	**24.00**

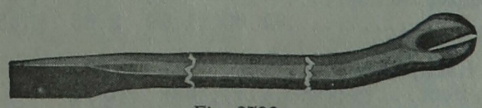


Fig. 2793

ONE-QUARTER BEND

Similar to other wrecking bars, but has the bend at the claw end at 45 degrees.

NOS.	**320**	**321**	**322**	**323**
Length, Inches	12	15	18	24
Size Steel, Inches	1/2	5/8	5/8	3/4
Weight per Dozen, Lbs.	9	16	19	37
Per Dozen	**$10.00**	**11.00**	**11.60**	**13.00**

NOS.	**324**	**325**	**326**
Length, Inches	30	36	42
Size Steel, Inches	3/4	7/8	7/8
Weight per Dozen, Lbs.	46	75	88
Per Dozen	**$14.00**	**17.50**	**22.50**

PINCH BARS

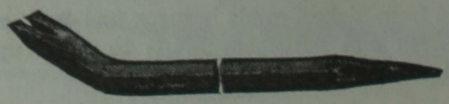


Fig. 2794

Forged from highest grade hexagon tool steel, carefully oil tempered and hardened. Has claw bent to 45 degrees at one end; other end is pointed, shaped like a center punch.

NOS.	327	328	329	330
Length, Inches	12	15	18	24
Size Steel, Inches	1/2	5/8	5/8	3/4
Weight per Dozen, Lbs.	9	16 1/8	19	37 1/2
Per Dozen	**$4.40**	**6.00**	**7.50**	**9.70**

NOS.	331	332	333
Length, Inches	30	36	42
Size Steel, Inches	3/4	7/8	7/8
Weight per Dozen, Lbs.	46 1/8	75 3/8	88 1/8
Per Dozen	**$12.00**	**16.00**	**18.50**

CROW BARS

Forged steel; oil finished; round body, with octagon and square lower end, hardened point.

Fig. 2795

WEDGE POINT

Weight Each, Lbs.	10	12	14	16	18
Length, Feet	4	4 1/2	4 5/6	4 11/12	5
Size Square, Inches	1	1 1/8	1 3/16	1 1/4	1 1/4
Each	**$1.60**	**1.90**	**2.25**	**2.55**	**2.90**

Weight Each, Lbs.	20	22	24	30
Length, Feet	5 1/3	5 7/12	5 3/4	6
Size Square, Inches	1 3/8	1 3/8	1 7/16	1 5/8
Each	**$3.20**	**3.50**	**3.85**	**4.80**

Fig. 2796

PINCH POINT

Weight Each, Lbs.	10	12	14	16	18
Length, Feet	4	4 1/2	4 5/6	4 11/12	5
Size Square, Inches	1	1 1/8	1 3/16	1 1/4	1 1/4
Each	**$1.60**	**1.90**	**2.25**	**2.55**	**2.90**

Weight Each, Lbs.	20	22	24	30
Length, Feet	5 1/3	5 7/12	5 3/4	6
Size Square, Inches	1 3/8	1 3/8	1 7/16	1 5/8
Each	**$3.20**	**3.50**	**3.85**	**4.80**

LINING BARS

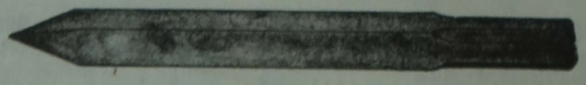


Fig. 2797

Tempered at working end.

Weight Each, Lbs.	18	20	22
Length, Feet	5	5 1/4	5 1/2
Size Square, Inches	1 1/4	1 3/8	1 3/8
Each	**$2.90**	**3.20**	**3.50**

TAMPING BARS

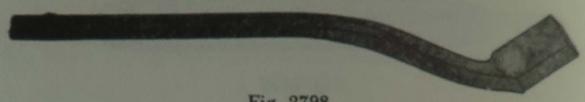


Fig. 2798

Solid forged steel; railroad tamping bar; with flattened rectangular tamper end.

Weight, Lbs.	**14**
Handle, Inches	7/8
Tamping End, Inches	3 1/2 x 3/4
Each	**$2.80**

CLAW BARS

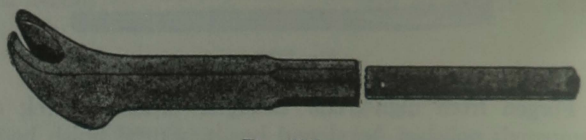


Fig. 2799

RAILROAD

Forged steel; oil finish; round body with square lower end; tempered claw and tempered bend pinch point at upper end, with heel.

Weight, Lbs.	**30**
Length, Feet	5
For Spikes, Inches	5/8
Each	**$6.00**

RAILROAD TRACK TONGS

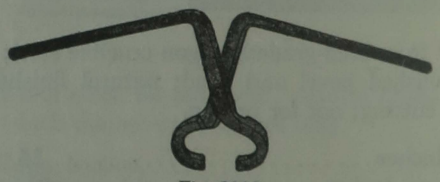


Fig. 2800

Forged steel; japanned finish; round handles; square arms, hinged on heavy steel rivet. Will open to take up to 6-inch girder rail.

Weight, Lbs.	**18**
Each	**$2.80**

SPIKE PULLERS

Fig. 2801

Drop forged steel. Used with claw bars.

Weight Each, Lbs.	**1 1/2**
Two-Ball, Each	**$** ....
Three-Ball, Each	....

TRACK GAUGES

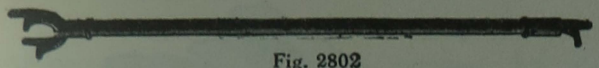


Fig. 2802

HUNTINGTON PATTERN

Iron pipe cross-piece 1 5/16 inch in diameter; plain finish, with malleable iron socketed track rests, one arched, with double bearing on track, the other plain with single bearing on track; standard gauge 4 feet, 8½ inches, in between rails; can also be furnished for metric or special size gauge.

	Per Dozen
NO. 100—Weight per Dozen, 126 Lbs.	....

RAILROAD TRACK LEVELS

Fig. 2803

Made of hardwood, steel handle. Malleable iron ends. For standard gauge track, 4 feet, 8½ inches, but we can also furnish for metre gauge track.

	Per Dozen
NO. 102—Weight per Dozen, 96 Lbs.	....

Prices on Application

JIM CROW RAIL BENDERS

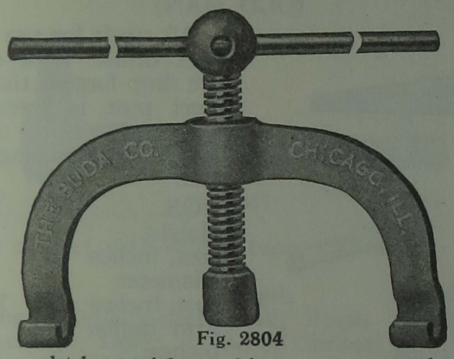


Fig. 2804

Best wrought iron with machine cut square thread steel screw. Japanned finish.

Size	1	2	3	4
For Rails up to Lbs. per Yard	80–100	60–75	30–55	12–30
Weight, with Lever, Lbs.	230	175	125	65
Span to Center of Claws, Ins.	30½	28	21¾	18
Diameter Screw, Inches	2¼	2¼	2	1⅝
Each	$40.00	31.00	25.00	21.00

Nos. 1 to 4 inch are furnished with cross bar and lever.

Size	5	6	7	8
For Rails up to Lbs. per Yard	16	20	25	50
Weight, without Lever, Lbs.	35	50	65	115
Span to Center of Claws, Ins.	13¾	18	21½	24
Diameter Screw, Inches	1⅝	1⅝	2	2¼
Each	$16.00	20.00	30.00	34.00

Nos. 5, 6 and 7 are furnished as illustrated; No. 8 is supplied without cross bar and with lever.

CAR MOVERS

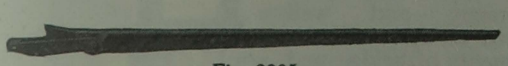


Fig. 2805

SHELDON

Handle made of malleable iron; the toe plate of hardened tool steel. The latter is removable and interchangeable. The heel or grip is made of mild steel.

	Each
NO. 1—Weight Each, 20 Lbs.	$5.00

EXTRA PARTS

Handle, Only	$1.50
Shoe Complete	1.50
Grip	.25
Large Toe Plate	.15
Small Toe Plate	.10

CAR MOVERS

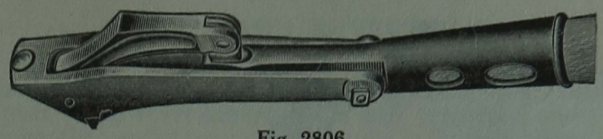


Fig. 2806

ATLAS

Made of malleable iron and steel, with a handle of best selected hardwood. Made with single, straight spur, or double spur set at an angle. Will not slip until worn and dull. Spurs are held in place by a plate. One extra set of spurs furnished with every car mover.

	Each
NO. VIIID—Complete; Length, 6 Feet; Weight Each, 20 Lbs.	$6.00

EXTRA PARTS

Spur or Bits	$0.25
Double Spur, Set	.25
Handle	1.50
Arch Lever	.75

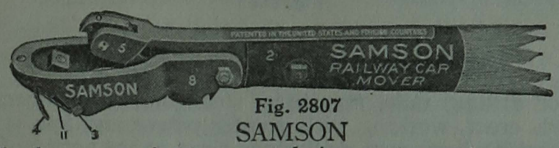


Fig. 2807

SAMSON

The leverage of this mover being compound, as soon as pressure is brought to bear upon handle the two points will come in contact with the car wheel at the proper rolling distance from the point where the wheel rests on the rail and in consequence the car wheel is immediately forced to turn.

	Each
NO. 10—Length, 64 Inches; Weight Each, 15 Lbs.	$5.00

EXTRA PARTS

Wood Handle	$1.50
Shoe for Triangular Spur	1.50
Shoe for Square Spur	1.50
Clamp	.20

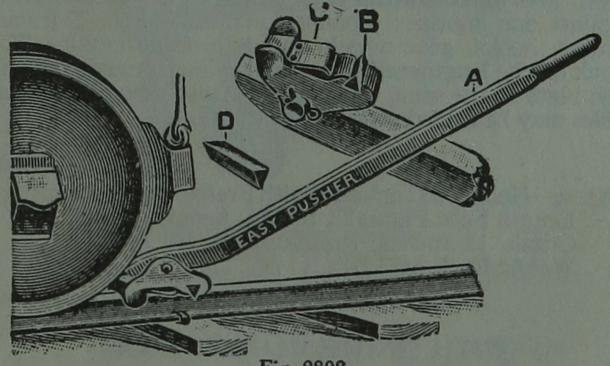


Fig. 2808

EASY

Handle bar made of steel, shoe of malleable iron; bit and spring made of finest tool steel.

	Each
NO. 20—Weight Each, 20 Lbs.	$6.00
Extra Steel Bits	.25

CAR REPLACERS

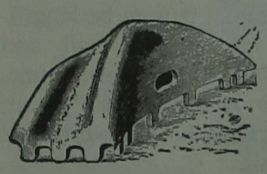


Fig. 2809
Inside

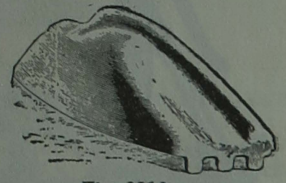


Fig. 2810
Outside

Made of pressed steel plate, guaranteed to re-rail the heaviest railroad equipment.

NOS.	1	2	3
Height of Rail for, Inches	5 to 6	4 to 5½	Under 4½
Weight per Pair, Lbs.	164	158	58
Per Pair	$		

Prices on Application

TRACK DRILLS

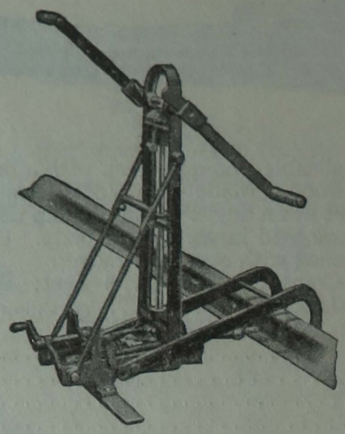


Fig. 2811

WITH DOUBLE CLUTCH HOOK

For drilling rails, structural steel, etc. The operator stands erect, working with greater power and less strain than with a horizontal drill; saves time, as the action of the bit is continuous; no loss of motion or time, as with a lever action ratchet drill; the bit is not withdrawn from the rail to get out of way of passing train; top of frame is thrown back, releasing the hooks, which are lifted out of the way.

Illustration shows the drill equipped with spindle and chuck for using flat bits, and with over-clutch hook. Thrust plates are made of high-grade steel, thoroughly case hardened, polished and ground; this ball thrust bearing is rated to carry approximately 2,200 pounds at normal speeds at which the drill will be operated. The type of construction is of the very best; the ball retainer is made of pressed steel, and separates the balls so that they do not grind against one another; japanned malleable iron T frame, braces, hooks, gear wheels and adjustable crank. The hook can be lengthened for use in drilling through rail and fish plate at the same time, and it is also designed so that holes may be drilled close to end of rail.

Each

NO. A—Height, 33 Inches; Width Frame, 9¼ Inches; Length Foot Plate, 22 Inches; Length Handle Crank, 11 Inches; Regular Twist Bit Spindle; Weight Each, 95 Lbs. ..... $.....

WITH SINGLE CLUTCH HOOK

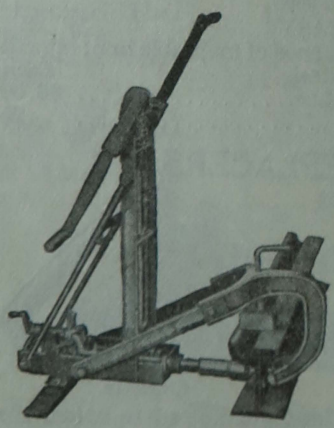


Fig. 2812

Single over-clutch hook is used for drilling girder or high T rails and I-beams; it may be lengthened to drill rail and plate at the same time. It is shaped to permit drilling holes close to end rail.

Each

NO. D—Height, 33 Inches; Width Frame, 9¼ Inches; Length of Foot Plate, 22 Inches; Length Handle Crank, 11 Inches; Regular Twist Bit Spindle; Weight, Lbs. ..... $.....

TRACK DRILLS

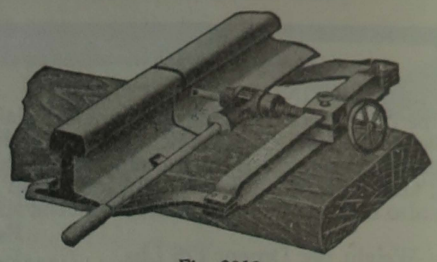


Fig. 2813

HORIZONTAL

A light reliable and serviceable drill, the clamps fasten under rail; by shifting the drill along the sliding bar, all the holes for fish plates or frogs can be drilled without removing the frame from the rail. Takes square shank drills. Without drill bit.

Each

NO. B.D.—Wrought Iron Frame; Cast Steel Ratchet with 18-Inch Wrought Iron Lever; Length of Slide Bar, 23 Inches; Diameter of Feed Wheel 7 Inches; Diameter of Feed Screw, ¾ Inch; Length of Feed, 7 Inches; Weight Each, 27 Lbs. $8.00

DRILLING POSTS

(OLD MAN)

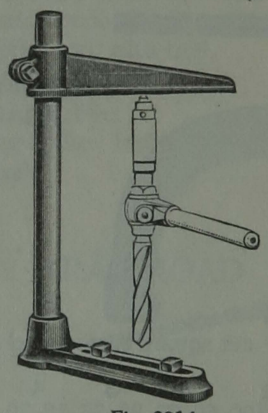


Fig. 2814

All steel; for use with ratchet drills. Foot and arm are drop forged; the finished steel post is screwed into foot and can be easily removed for packing in tool kit.

NOS.	8	10	12
Height post, Inches	16	20	26
Diameter post, Inches	1	1¼	1½
Arm radius Inches	8	10	12
Weight Each, Lbs.	9	16	30
Each	$5.00	6.00	7.50

ADJUSTABLE CLAMP TYPE

Made with drop forged arm and clamp, and bar steel standard; has alloy steel heel screw. Collar screw and hardened nuts, having convex bearing surfaces fitting concave seats in clamp jaws; holes through jaws have ample clearance, thus permitting clamp jaws to tilt freely without danger of bending the post. Especially convenient and well adapted to meet the acquirements of bridge and structural iron workers.

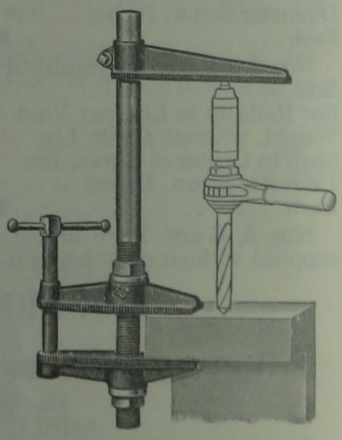


Fig. 2815

NOS.	C8	C10	C12
Height Post, Inches	16	20	26
Diameter Post, Inches	1	1¼	1½
Arm Radius, Inches	8	10	12
Capacity Clamp, Inches	4	4½	5
Weight Each, Lbs.	16	27	42
Each	$7.00	8.00	10.00

One in a Box

RATCHET DRILLS

STANDARD REVERSIBLE

All parts are made from drop forgings or bar steel; pawl and center are tool steel carefully tempered; polished finish. The reversing jigger is well protected and conveniently located; end of the handle is finished round and smooth for the operator's hand.

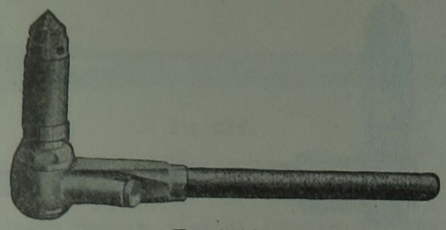


Fig. 2816

Sleeve ratchets with square taper shank.

NOS.	Length, Inches	Drill Socket Taper	Length Head, Inches	Feed, Inches	Weight Each, Lbs.	Each
9	9	St'd Bit Stock	5	2	1¾	$4.75
12	12	No. 1 Square	6	2¼	4	5.00
15	15	No. 1 Square	6¾	2½	6¼	5.75
18	18	No. 1 Square	7¾	3	9½	6.75
22	22	No. 2 Square	9	3½	13½	7.75

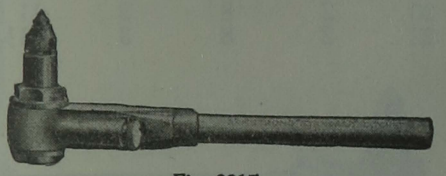


Fig. 2817

Boiler ratchet with square taper socket.

NOS.	Length, Inches	Drill Socket Taper	Length Head, Inches	Feed, Inches	Weight Each, Lbs.	Each
9B	9	St'd Bit Stock	3¼	1⅛	1½	$4.50
12B	12	No. 1 Square*	4⅜	1½	3½	4.75
15B	15	No. 1 Square	5	1¾	5½	5.50
18B	18	No. 1 Square	5½	2	8	6.50
22B	22	No. 2 Square†	6	2¼	11½	7.50

*Takes drill shank ⅜ inch square at small end and ⅝ inch square at large end.

†Takes drill shank ½ inch square at small end and ¾ inch square at large end.

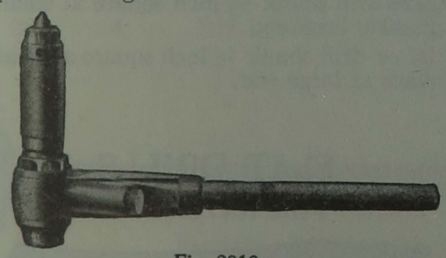


Fig. 2818

Sleeve ratchets with Morse taper socket.

NOS.	Length, Inches	Morse Taper Shank Nos.	For Taper Shank Drills, Inches	Length Head, Inches	Feed, Inches	Wgt. Each, Lbs.	Each
9M	9	1	1/16–9/16	5	2	1¾	$5.00
12M	12	2	37/64–2 29/32	6	2¼	4	5.25
15M	15	3	59/64–1¼	6¾	2½	6¼	6.00
18M	18	3	59/64–1¼	7¾	3	9¼	7.00
22M	22	4	1 17/64–2	9	3½	13	8.00

All Above, One in a Box

RATCHET DRILLS

STANDARD REVERSIBLE

All parts are made from drop forgings or bar steel; pawl and center are tool steel carefully tempered; polished finish. The reversing jigger is well protected and conveniently located; end of the handle is finished round and smooth for the operator's hand.

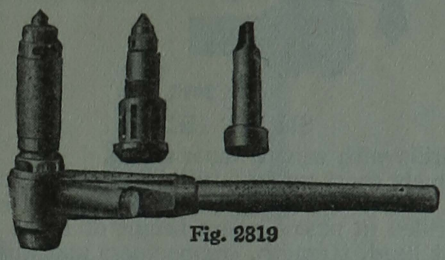


Fig. 2819

STANDARD RATCHET COMBINATION

Combination includes sleeve ratchet for Morse taper shank drill, a square taper socket to fit same and a short spindle with feed screw by means of which the ratchet can be converted into a boiler ratchet or adapted to use square taper shank drills.

NOS.	Length, Ins.	Size of Drill Sockets	Weight Each, Lbs.	Each
9C	9	St'd Bit Stock and No. 1 Morse	2½	$7.50
12C	12	No. 1 Sq. Taper and No. 2 Morse	5¼	7.75
15C	15	No. 1 Sq. Taper and No. 3 Morse	8	9.00
18C	18	No. 1 Sq. Taper and No. 3 Morse	12	10.75
22C	22	No. 2 Sq. Taper and No. 4 Morse	17	11.50

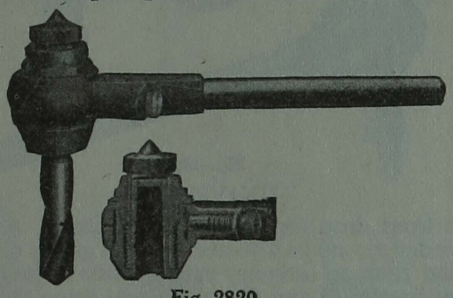


Fig. 2820

For drills with Morse taper shank.
Short head, long feed, reversible.
Is self-discharging and can be reversed instantly; the construction is simple, compact and strong.

NOS.	Morse Taper Shank Nos.	Length, Inches	Length Head, Inches	Feed, Inches	Weight Each, Lbs.	Each
2R	3	12	3¾	2½	6¾	$8.00
3R	3	18	3¾	2½	9	10.00

SOCKETS FOR SQUARE SHANK DRILLS

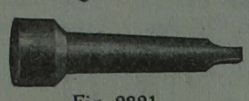


Fig. 2821

Taking ratchet drills from ⅛ to 2 inch with square shank.

NOS.	Size Shank	Takes Drills with Square Taper Shanks	Each
1	No. 2 Morse	No. 1 Shank ⅜x⅝ inch square	$2.00
2	No. 3 Morse	No. 1 Shank ⅜x⅝ inch square	2.00
3	No. 4 Morse	No. 2 Shank ½x¾ inch square	2.50

Note.—By means of sheaves and sockets, standard ratchet with Morse taper sockets can be made to take smaller sized drills, and drills with square taper and blacksmith ½ and ¾ inch shank.

All Above, One in a Box

RATCHET DRILLS

ARMSTRONG

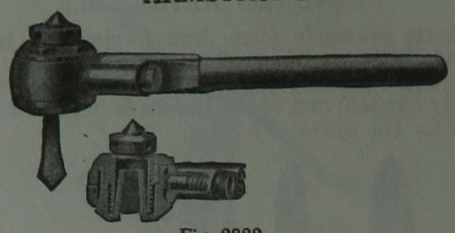


Fig. 2822

SHORT HEAD

For drills with square taper shank.

Extremely short ratchet drill, length of feed considered; will be found extremely useful wherever holes have to be drilled in places where height of space is limited. Its short head, strength, compactness and quick reverse make it a perfect boiler ratchet. All parts are drop forged or made from bar steel; pawl and center are tool steel, carefully tempered.

NOS.	For Square Taper Nos.	Length, Inches	Length Head, Inches	Feed, Inches	Weight Each, Lbs.	Each
2A	1	12	2¾	1½	6	$8.00
2E	2	12	2¾	1½	6	8.00
3A	1	18	2¾	1½	8	10.00
3E	2	18	2¾	1½	8	10.00

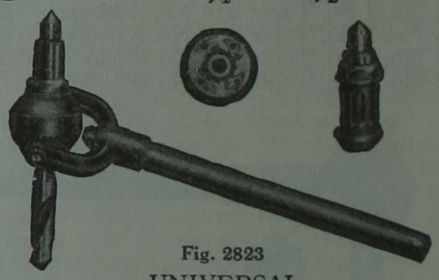


Fig. 2823

UNIVERSAL

Made from drop forgings and bar steel. All working parts hardened; no ball joints or bevel gears, drills 10 per cent faster than an ordinary ratchet, two inches of motion at end of handle in any direction, will drive the drill; the universal motion of the ratchet is due to the fact that the axis of the two trunnions on which the handle turns is at an acute angle with the axis of the drill. Set the fixing screw up into one of the three countersinks and you have a rigid handle, as in the common ratchet. In two of these fixed positions the handle stands at an angle out of the way of possible obstructions. In the No. 6 ratchet there are twelve large teeth in the ratchet and five pawls which engage one at a time, thus the pawls catch sixty times in a revolution, decreasing lost motion 80 per cent.

NOS.	Lgth. Ins.	Drill Socket Taper Nos.	Length Head, Ins.	Feed, Ins.	For Drills, Ins.	Wght. Each, Lbs.	Each Complete
4M	14	1 Square	4⅜	1½	..	5	$12.00
4K	14	2 Morse	5⅞	1½	37/64-29/32	5	12.00
5J	16	1 Square	5½	1⅞	..	8	15.00
5L	16	2 Square	5½	1⅞	..	8	15.00
5O	16	3 Morse	7	1⅞	59/64-1¼	8	15.00
6F	18	2 Square	5⅞	2¼	..	12	18.00
6N	18	3 Morse	7⅜	2¼	59/64-1¼	12	18.00
6S	18	4 Morse	7⅝	2¼	1 17/64-2	12	18.00

EXTRA SPINDLES

NOS.	4M	4K	5J	5L
Each	$2.40	2.40	3.00	3.00
NOS.	5O	6F	6N	6S
Each	$3.00	3.60	3.60	3.60

M and K spindles are interchangeable in No. 4 Ratchet, J, L and O in No. 5 Ratchet and F, N and S in No. 6 Ratchet.

RATCHET DRILLS

ARMSTRONG—WESTON

Made with double pawl and ratchet wheel, which gives a stronger bearing than the small ratchet teeth of other makes. A sleeve covers the feed screw, protecting it from dirt and grit; made from drop forged steel, with working parts hardened. For square taper drills only.

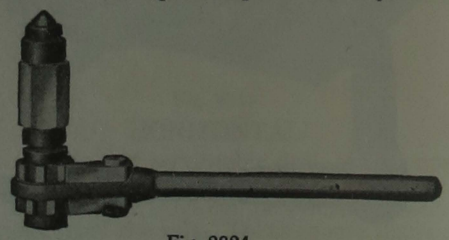


Fig. 2824

SLEEVE RATCHET

NOS.	Length, Inches	For Square Tapers Nos.	Length Head, Inches	Feed, Inches	Weight Each, Lbs.	Each
1W	12	1	6⅞	2½	6½	$7.60
2W	14	1	6⅞	2½	6¾	8.00
3W	16	1	6⅞	2½	7¼	8.75
4W	18	2	8	3	10½	9.75
5W	20	2	8	3	11	10.75
6W	22	2	8	3	11½	11.75

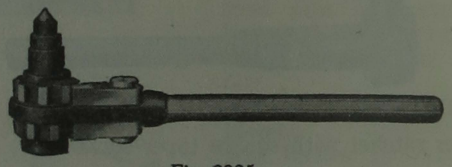


Fig. 2825

BOILER TYPE

Similar construction as regular type illustrated above but adapted especially to boiler construction and repair work.

NOS.	Length, Inches	For Square Tapers Nos.	Length Head, Inches	Feed. Inches	Weight, Lbs.	Each
1WB	12	1	4½	1¾	5	$7.60
2WB	14	1	4½	1¾	5½	8.00

No. 1 takes drill shank ⅜ inch square at small end and ⅝ inch square at large end.

No. 2 takes drill shank ½ inch square at small end and ¾ inch square at large end.

FLAT DRILLS

FOR RATCHETS

Fig. 2826

Made of best quality tool steel; tempered and oil finished.

Size, Inches	⅜	½	⅜	¾	⅞
Weight Per Dozen, Lbs.	3	4	5	6	7
Per Dozen	$4.80	4.80	4.80	5.40	5.40
Size, Inches	**1**	**1⅛**	**1¼**	**1⅜**	**1½**
Weight Per Dozen, Lbs.	8	8½	9	9½	11
Per Dozen	$5.40	6.00	6.60	7.20	7.80

One-half Dozen in a Box

RATCHET DRILLS

KEYSTONE

Drop forged steel bodies; hardened wearing parts; cold drawn tubing handles.

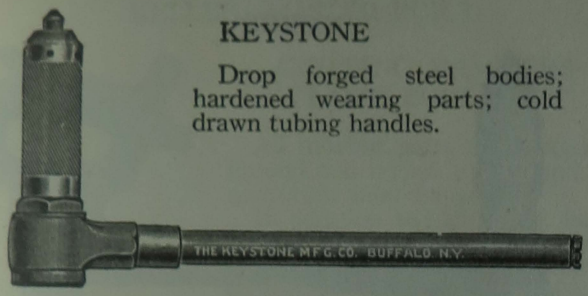


Fig. 2827

With long feed; for square taper shank drills.

NOS.	Length Handle, Inches	For Square Taper Nos.	Height Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
1	10	1	5 5/16	1 3/4	3 1/2	$5.00
2	14	1	7 5/16	2 3/4	6 5/8	5.75
3	16	1	7 5/16	2 3/4	7 3/8	6.50
4	18	2	9 1/2	2 3/4	12 1/2	7.25
5	22	2	9 1/2	2 3/4	13	7.50
6	24	2	9 1/2	2 3/4	13 1/2	7.75
7	28	2	9 1/2	2 3/4	14 1/2	8.25

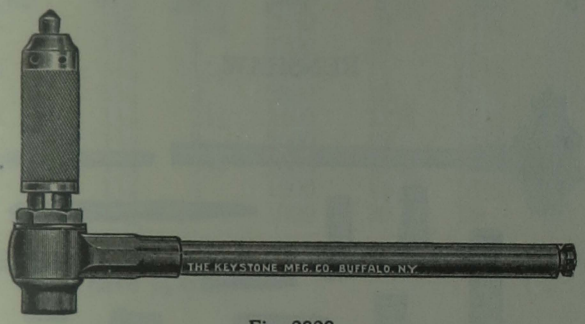


Fig. 2828

For Morse taper shank drills.

NOS.	Length Handle, Inches	For Taper Shank Nos.	Height Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
21	10	2	6 1/8	1 3/4	3 3/4	$5.25
22	14	3	8 3/16	2 3/4	6 1/2	6.00
23	16	3	8 3/16	2 3/4	7 3/8	6.75
24	18	4	9 1/2	2 3/4	12	7.50
25	22	4	9 1/2	2 3/4	12 1/2	7.75
26	24	4	9 1/2	2 3/4	12 3/4	8.00
27	28	4	9 1/2	2 3/4	13 1/2	8.50

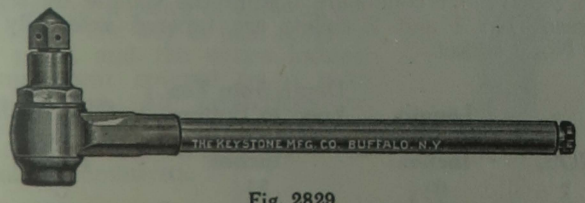


Fig. 2829

BOILER—SHORT FEED

For square shank drills only.

NOS.	Length Handle, Inches	For Square Taper Nos.	Height Head, Inches	Length Feet, Inches	Weight Each, Lbs.	Each
31	10	1	3 13/16	1 1/8	2 7/8	$5.00
32	14	1	4 1/2	1 1/2	5 1/8	5.75
33	16	1	4 1/2	1 1/2	5 7/8	6.50
34	18	2	5 1/4	2	9	7.25
35	22	2	5 1/4	2	9 3/4	7.50
36	24	2	5 1/4	2	10	7.75
37	28	2	5 1/4	2	10 1/2	8.25

RATCHET DRILLS

KEYSTONE

Reversible, drop forged steel bodies and hardened steel wearing parts; handles made of cold drawn tubing with steel rod running through it on which is direct pawl and coil spring; reverse motion is made by withdrawing and taking half-turn on knob at end of bar handle.

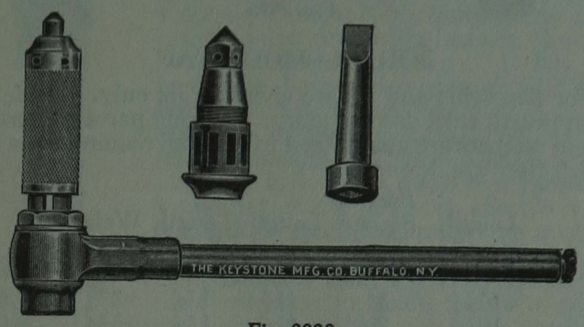


Fig. 2830

COMBINATION NO. 200

Ratchet for taper shank twist drills; sleeve for square shank drills, and short boiler socket for square drills; sockets interchangeable.

NOS.	Length Handle, Inches	For Drills Morse Taper Shank, Nos.	Square Taper Nos.	Weight Each, Lbs.	Each Complete
51	10	2	1	4 7/8	$7.75
52	14	3	1	9 7/8	9.00
53	16	3	1	10 1/8	10.00
54	18	4	2	16 1/2	11.25
55	22	4	2	17 1/2	11.50
56	24	4	2	17 1/2	11.75
57	28	4	2	18 1/2	12.25

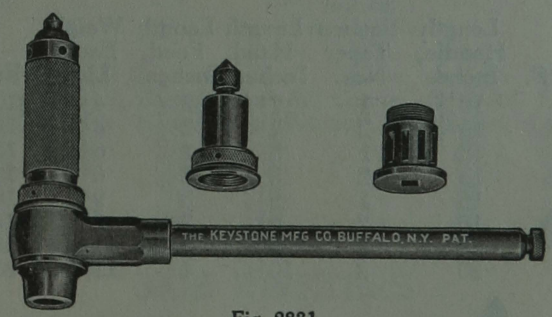


Fig. 2831

COMBINATION NO. 300

Four complete ratchets in one, has long and short feed for any style of Morse taper or square taper shank drills. All parts interchangeable. Universally used in boiler and machine shops; structural and railroad work, etc.

NOS.	Length Handle, Inches	For Drills Morse Taper Shank, Nos.	Square Taper Nos.	Weight Each, Lbs.	Each Complete
50M	8 1/2	1	Bit Stock	2 3/8	$7.00
51M	10	2	1	4 13/16	7.75
52M	14	3	1	8 1/2	9.00
53M	16	3	1	9 1/2	10.00

Note.
NO. 1—Square Socket is 3/8-Inch Square at Small End; and 5/8-Inch Square at Large End.
NO. 2—Square Socket is 1/2-Inch Square at Small End, and 3/4-Inch Square at Large End.

RATCHET DRILLS

PACKER

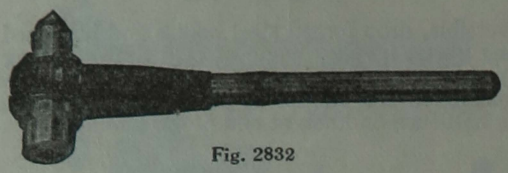


Fig. 2832

BOILER—MODEL AF

For flat drills and square shank drills only. Made of open hearth steel drop forgings. Working parts hardened. These ratchets are guaranteed to meet all requirements for which they are intended.

NOS.	Length Handle, Inches	Socket Square Taper Nos.	Length Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
1	10½	1	4⅛	1¼	3¾	$9.00
1B	10½	2	4⅛	1¼	3¾	9.00
2	13	1	5	1⅜	5¼	10.50
2B	13	2	5	1⅜	5¼	10.50

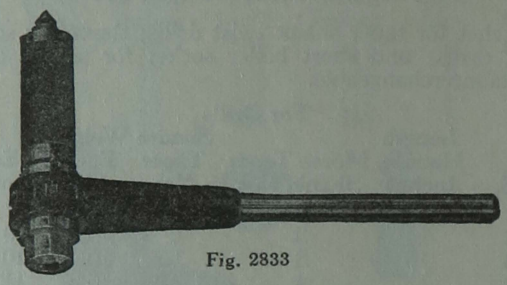


Fig. 2833

MODEL AE

With long feed; for flat drills and square shank drills, only.

NOS.	Length Handle, Inches	Socket Square Taper Nos.	Length Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
1	10½	1	7⅛	2¼	4½	$10.50
1B	10½	2	7⅛	2¼	4½	10.50
2	13	1	8	2½	6½	13.50
2B	13	2	8	2½	6½	13.50
3	16	1	9⅛	3	9¾	16.00
3B	16	2	9⅛	3	9¾	16.00
4	18	2	9¾	3½	11½	19.00
5	20	2	10¾	4	15¾	23.00

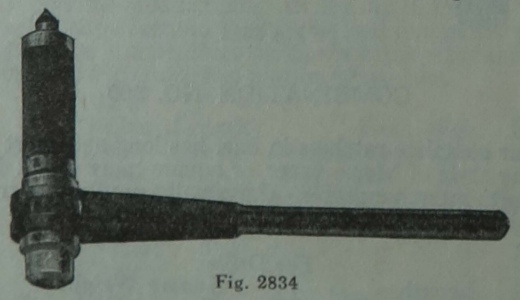


Fig. 2834

MODEL AG

With long feed; for Morse taper shank drills or Morse taper sockets and flat drill sockets.

NOS.	Length Handle, Inches	Socket Taper Nos.	Length Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
1	10½	1	6⅞	1¾	5	$13.00
2	13	2	7⅞	2	6½	16.00
3	16	3	9¼	2¾	9½	20.00
4	18	4	10¼	2¾	11	25.00

RATCHET DRILLS

PACKER

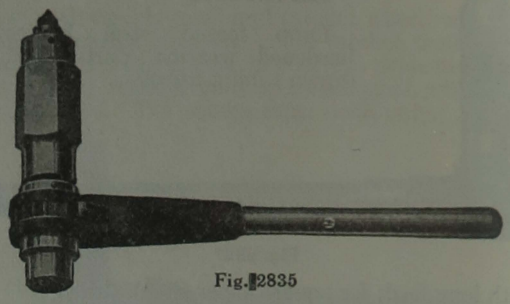


Fig. 2835

RAILROAD—MODEL AJ

Made of open hearth steel drop forgings, working parts hardened, with hexagon sleeve and square socket.

NOS.	Length Handle, Inches	Socket Square Nos.	Length Head, Inches	Length Feed, Inches	Weight Each, Lbs.	Each
1	10½	1	7⅛	2¼	5	$10.50
2	13	1	8	2½	7	13.50
3	16	1	9½	3	10½	16.00
4	18	2	10¼	3⅜	12½	19.00
5	20	2	10¾	3¾	16	23.00

RENSHAW

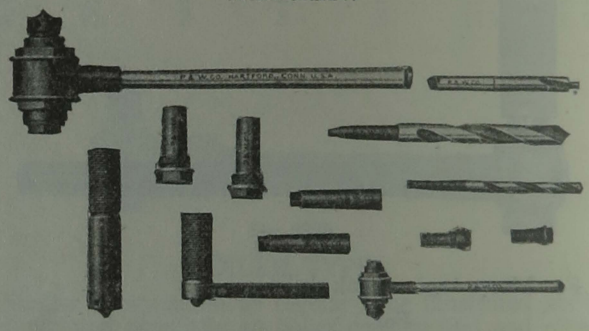


Fig. 2836

These tools are made in two sizes. No. 1 taking drills to ½ inch and No. 3 taking drills to 1½ inches; all the parts are made of steel and hardened. No. 1 has one collet for drills with shank 3/16x3/8x1¼ inches and one collet for drills fitting No. 1 Morse standard taper socket.

No. 3 has one collet, No. 5 takes square shank drills with No. 1 shank, 5/8x3/4x1½ inches; also collets Nos. 1, 2 and 3 for Morse standard taper shanks. No. 3 and No. 5 collets are held in the spindle by screw thread. No. 1 and 2 collets are tapered externally to fit No. 3 socket.

NOS.	Length Handle, Inches	Depth from Top Feed to Bottom of Collet, Inches	Full Depth of Feed, Inches
1	9½	2½	5
2	18	1½	2¾

NO. 1—Ratchet drill complete, with two collets... $11.00
NO. 1—Ratchet drill, with one collet..... 9.40
NO. 1—Collet, with square or taper hole, each.... 1.60
NO. 3—Ratchet drill complete, with four collets... 15.00
NO. 3—Ratchet drill with No. 3 or No. 5 collet only..... 11.05
NO. 3—Ratchet drills, with Nos. 1, 2 and 3 collets only..... 13.25
NO. 1 or NO. 2—Collet for No. 3 ratchet, each.... 1.10
NO. 3 or NO. 5—Collet for No. 3 ratchet, each.... 1.75
We will also supply collets for No. 3 Renshaw ratchet for taper square shank drills, ¾x½x1¾ inches long, each..... 1.75

PNEUMATIC TOOLS

KELLER—MASTER BUILT

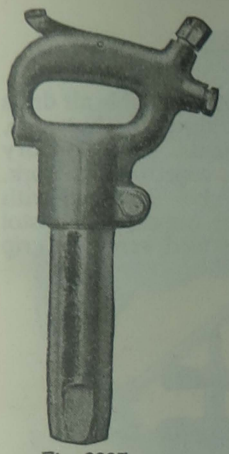


Fig. 2837

CHIPPING HAMMERS CLAMP BOLT TYPE

All moving parts are hardened, ground and lapped to size and are accurately interchangeable.

In addition to high speed, hard-hitting effectiveness, the general design provides for quick inspection, economical upkeep and repairs. Handles are drop-forged, oil and heat treated and sand blasted.

Can be furnished with closed or open handle, with the piston type of throttle valve and round or hexagon bushing.

Size	Diam. Piston, Inches	Length Stroke, Inches	Blows Per Minute	Cubic Feet Free Air Per Min.	Length Over All, Inches	Weight Each, Lbs.
Valveless	1 1/8	1 1/4	2900	6 1/2	10 1/2	6
0	15/16	1 3/8	2900	6 1/2	9 1/2	6
0X	15/16	1 7/8	2850	9	11 1/4	8 1/2
1	1 1/8	1	3200	10	11	12
1X	1 1/8	1 1/2	3000	11	11 7/8	13
2	1 1/8	2	2800	12	12 1/2	13 1/2
2X	1 1/8	2 1/2	2400	12 1/2	13 1/2	14
3	1 1/8	3	2000	13	14 1/2	15
3X	1 1/8	3 1/2	1600	13 1/2	15 1/2	15
4	1 1/8	4	1300	14	16 1/2	16
5	1 3/16	5	1000	20	18	22

Note.—No. 5 furnished with 3/8-inch hose connection; all others have 1/4-inch.

CHIPPING HAMMERS "SURE-LOX" TYPE

Equipped with locking device, eliminating the clamp bolt which in some cases has been found objectionable, especially for work in close quarters.

This method of attaching the handle is exceedingly simple and efficient. The handle is locked in a positive and rigid manner directly to the cylinder by means of a key inserted in the cylinder, and engaging one of a series of slots in the handle. The key is held securely in place, and the entire locking arrangement covered by a neat spring clip. All projections or obstructions which might interfere with the convenient handling of the tool are eliminated.

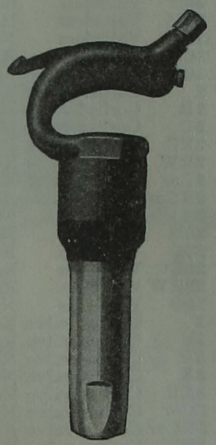


Fig. 2838

Size	Diam. Piston, Inches	Length Stroke, Inches	Blows Per Minute	Cubic Feet Free Air Per Min.	Length Over All, Inches	Weight Each, Lbs.
3X	1 1/8	3 1/2	1600	13 1/2	15 1/2	15
4	1 1/8	4	1300	14	16 1/2	16
5	1 3/16	5	1000	20	18	22

Nos. 3X and 4 have 1/4-inch hose connection. No. 5 has 3/8-inch.

No. 5 will be furnished with either round or octagon bushing for either 3/4 or 7/8-inch chisel steel as specified.

All Prices on Application

PNEUMATIC TOOLS

KELLER—MASTER BUILT

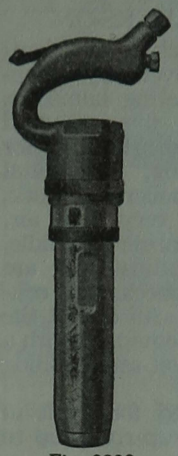


Fig. 2839

RIVETING HAMMERS

Provided with a valve mechanism so constructed that pistons of various lengths may be interchangeably employed. Various practical considerations make it desirable at times to use a short piston delivering light blows in extremely rapid succession; and at other times to employ a longer piston producing heavier blows in somewhat slower succession. It has not heretofore been thoroughly practical to interchange short and long pistons in the same tool for the reason that when a short piston was employed it was possible for the piston to arrive at a dead point, where it would flutter and not work effectively, or discontinue operating entirely on account of the port holes in the valve being a sufficient distance from the rear end of the piston chamber to enable the air to get in front of the piston when the piston was in its rearward position.

The construction of the valve mechanism is such that the valve is easily accessible and may be readily and conveniently removed, as there is no part of the valve box overhanging or abutting against either end of the valve.

All sizes can be furnished with inverted handles in place of the regular open or closed handle. The inverted handles are drop-forged, heat-treated and sand-blasted, and are equipped with regular piston type throttle valves.

With Open and Closed Handles

NOS.	Length Stroke, Inches	Capacity Rivets, Inches	Blows Per Minute	Size Hose Connection, Ins.	Length Over All, Inches	Weight Each, Lbs.
40	4	9/16	1080	1/4	17	14
50	5	3/4	1000	3/8	18	20
60	6	7/8	760	3/8	19	23
80	8	1 1/8	700	3/8	21	25
90	9	1 1/4	620	3/8	22	26

With Inverted Handles

NOS.	Length Stroke, Inches	Capacity Rivets, Inches	Cubic Feet Free Air Per Min.	Size Hose Connection, Ins.	Length Over All, Inches	Weight Each, Lbs.
40	4	9/16	20	1/4	12 1/2	14
50	5	3/4	25	3/8	13 1/2	20
60	6	7/8	25	3/8	15	23
80	8	1 1/8	25	3/8	17	25
90	9	1 1/4	25	3/8	18	26

JAM RIVETERS

Particularly adapted for riveting in confined or narrow spaces, between channels on ships or structural work, and also for flue expanding and crown sheet cleaning on locomotives, or wherever riveting must be done in close quarters.

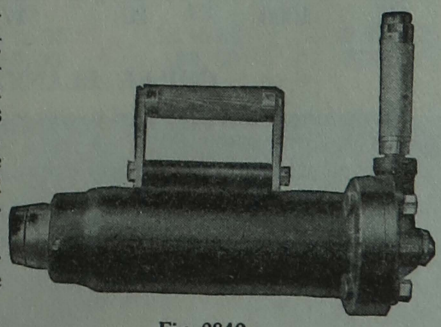


Fig. 2840

Provided with wood handles for holding and are arranged for use with or without extension or tail piece.

Size, Inches	Length Stroke, Inches	Blows Per Minute	Free Air Cubic Feet Per Minute	Length Over All, Inches	Weight Each, Lbs.
1 5/16x5	5	800	30	18	38
1 3/4x6	6	775	30	19	60

All Prices on Application

PNEUMATIC TOOLS

KELLER—MASTER-BUILT

HOLDERS-ON

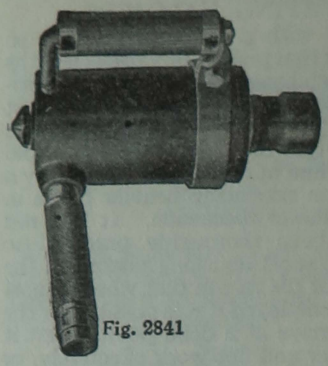


Fig. 2841

For backing up rivets when driven by pneumatic riveting hammers. Made in five standard sizes. Indispensable for shipbuilding, structural steel and boiler shop work. Consume very little air, are convenient to handle, easy to adjust and are simple in mechanical construction. All except the No. 0 are equipped with a special rivet-set retaining device.

The No. 0 Holder-On is recommended for work in extremely close quarters, and for backing up rivets up to and including 7/16 inch.

NOS.	Style Piston	Length Over All With Rivet Set, Inches	Length Stroke, Inches	Dia. Piston, Inches	Weight, Lbs.	Each
4	Long center	10	4	3 1/8	18	$....
4E	Long offset	10	4	3 1/8	18	....
1X	Short center	6 5/8	1 3/4	3 1/8	12	....
E1X	Short offset	7 1/2	1 1/2	3 1/8	14	....
0	Midget offset	4 1/4	1 3/8	2	5 1/2	....

All furnished with 3/8-inch hose connection.

SAND RAMMERS

For general foundry work, for ramming up flasks, bolsters, side frames, etc., pit work, heavy moulds, and for tamping concrete, clay, sand, etc. Equipped with straight-line air travel valve—the valve which routes the air directly through the center of the valve to the rear of the piston; the valve which operates positively regardless of fluctuations of air supply. Accurately balanced so that the inertia of the moving parts is completely absorbed. The operator sustains practically no part of the weight of the tool, merely guiding it. The speed and strength of blow is easily graduated by throttle regulation.

Fig. 2842

Style and Size	Blows per Minute 90 Lb. Pressure	Length Over All, Inches	Weight with Butt, Lbs.	Each
7X	950	47 1/2	23	....
4X	1000	20	17	....

CHISEL BLANKS

Drop forged and machined to correct size. Furnished in all styles for various work.

For all standard scaling and chipping hammers.

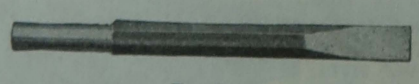


Fig. 2843

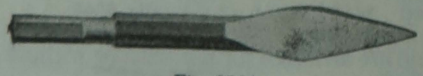


Fig. 2844

Fig. 2845

All Prices on Application

PNEUMATIC TOOLS

KELLER—MASTER-BUILT

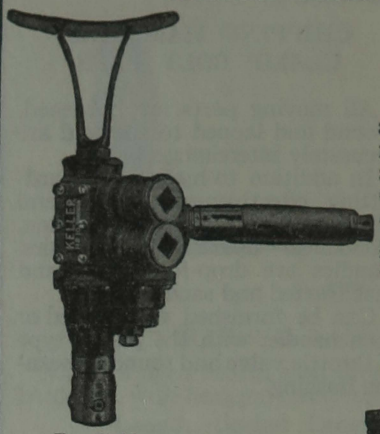


Fig. 2846

DRILLS

Non-reversible air drills are adapted for shipyards, railroads, shop, foundry and construction work. Can be furnished with either breastplate, pistol grip, feed screw or grip handles.

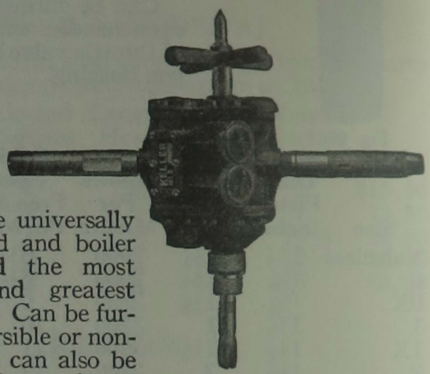


Fig. 2847

Valve types are universally used for shipyard and boiler work. Withstand the most severe service and greatest amount of abuse. Can be furnished either reversible or non-reversible. These can also be furnished with breastplates, grip handles or feed screws. Illustrations show drills furnished with breastplate and side handle and with feed screws.

Size NO.	Type	Description	Cap. Drills Ins.	Morse Taper Socket Nos.	Free Speed at 80 Pressure R.P.M.	Wgt. Each, Lbs.	Each
00S	Valveless	Slow speed	3/8	0Ch.	1200	8 1/2	.....
00H	Valveless	High speed	1/4	00Ch.	2400	8	.....
10	Valveless	Non-reversible	9/16		750	12	.....
10R	Valveless	Reversible	9/16		750	13	.....
10H	Valvelsss	Non-reversible	1/2		1050	11	.....
2	Corliss valve	Non-reversible	7/8	2	700	22	.....
2R	Corliss valve	Reversible	7/8	2	700	22	.....
2C	Corliss valve	Non-rev. comp.	1 1/4	3	300	26	.....
2RC	Corliss valve	Rev.compound	1 1/4	3	150	26	.....
2RW	Corliss valve	Rev.wood boring			700	22	.....
2Cor	Corliss valve	Non-rev. cl. cor.	1 1/4	3	225	30	.....
2RCor	Corliss valve	Rev. cl. corner	1 1/4	3	225	30	.....
20	Valveless	Non-reversible	7/8	2	700	22	.....
20R	Valveless	Reversible	7/8	2	700	22	.....
20C	Valveless	Non-rev. comp.	1 1/4	3	300	26	.....
20RC	Valveless	Rev.compound	1 1/4	3	150	26	.....
20RW	Valveless	Rev.wood boring			700	22	.....
20G	Valveless	Non-rev. grinder			3000	25	.....
3	Corliss valve	Non-reversible	1 1/4	3	375	40	.....
3R	Corliss valve	Reversible	1 1/4	3	375	40	.....
3H	Corliss valve	Non-reversible	1 1/4	3	550	35	.....
3X	Corliss valve	Non-reversible	1 3/8	4	375	40	.....
3XR	Corliss valve	Reversible	1 3/8	4	375	40	.....
3Cor.	Corliss valve	Non-rev. cl. cor.	2 1/2	4	140	48	.....
3RCor	Corliss valve	Rev. cl. corner	2 1/2	4	140	48	.....
3RW	Corliss valve	Rev. wood boring			550	40	.....
4	Corliss valve	Non-reversible	2 1/2	4	275	55	.....
4R	Corliss valve	Reversible	2 1/2	4	275	55	.....
4C	Corliss valve	Non-rev. comp.	3	4	100	70	.....
4RC	Corliss valve	Reversible comp.	3	4	100	70	.....
4XC	Corliss valve	Non-rev. comp.	3	5	100	70	.....
4XRC	Corliss valve	Reversible comp.	3	5	100	70	.....

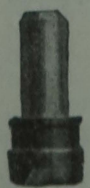


Fig. 2848

RIVET SETS

Furnished with button head, pan head, steeple head, shallow or flush. Made from highest quality alloy steel and specially heat treated to assure uniform temper.

Fig. 2849

All Prices on Application

TURNTABLES

UNIVERSAL—BALL BEARING

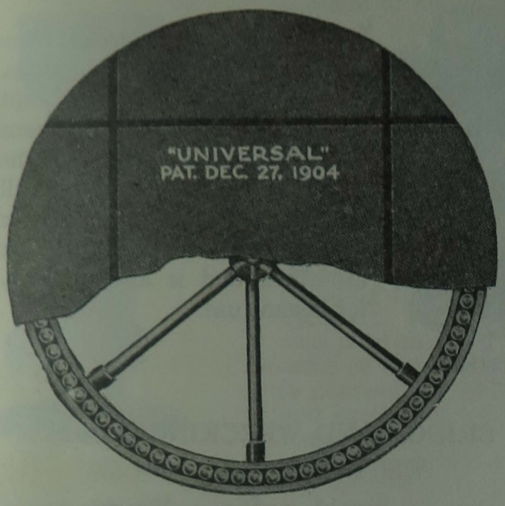


Fig. 2850

Revolves on a serpentine circular track filled with 2, 2½ or 3-inch balls, according to the diameter of the turntable. As the weight of the table is sustained only by those balls at the highest point, friction is greatly reduced. All tables, regardless of size and style, are 6 inches in depth, allowing of their being placed in any flooring. The top casting overlaps the bottom, making it impossible for dust to accumulate. Locking device is automatic and at all times out of the way.

Loaded to full capacity or carrying no weight at all, tables may be turned by one man.

NO. 1

WITHOUT LOCKING DEVICE

With plain checkered top, and without grooved track.

Fig. 2851

Diameter, Inches	42	48	60	72	96
For Track Gauge, Inches	18 to 24	18 to 30	18 to 36	18 to 48	48 and up
Each	$70.00	75.00	105.00	140.00	280.00

Fig. 2852

NO. 2

WITH LOCKING DEVICE

With grooved track top and locking device.

Diameter, Inches	42	48	60	72	96
For Track Gauge, Inches	18 to 24	18 to 30	18 to 36	18 to 48	48 and up
Each	$75.00	85.00	115.00	150.00	290.00

NO. 3

WITH LOCKING DEVICE AND GUARD RAILS

With grooved track top, locking device and guard rails.

Fig. 2853

Diameter, Inches	42	48	60	72	96
For Track Gauge, Inches	18 to 24	18 to 30	18 to 36	18 to 48	48 and up
Each	$95.00	105.00	130.00	170.00	310.00

When ordering, give gauge of track and wheel base of cars or diameter of tables. If flange of wheels runs on the outside, state; otherwise will assume that it rests on the inside.

SCREW JACKS

DOUGHBOY—GENERAL PURPOSE

Fig. 2854

All-steel jack of great strength and remarkably light weight, designed for the class of work usually done by hydraulic and screw jacks. Can be furnished in either worm gear or bevel gear type. The worm gear type is recommended because, while it is somewhat slower than a bevel gear jack, it is easier to operate. The worm gear type requires twelve revolutions of the worm shaft to raise the cap one inch. The outer casing telescopes the column and is positively prevented from turning by two flat sides on each tube. A positive check to prevent over-travel of the screw is provided by an outside upset at the top of the tubular column and an inside upset at the bottom of the tubular case. When these two projections engage, further movement of the screw is impossible and damage to screw or thread is thus positively prevented. It will remain elevated under load for any length of time without backing down.

The supporting column outer casing and screw are made of seamless cold drawn tubing having a tensile strength of 80,000 pounds per square inch. The column is electrically welded to a drop forged base; the cap is also a drop forging. The nut within which the lift screw turns is made of phosphor bronze; worm gear is made of machined steel, hardened and ground; the load is carried on roller bearings. The step and head are electrically welded to the outer casting. Lubrication is effected through an oil hole in the cap which oils the screw, nut, and roller bearing. The worm gear is lubricated through two oil holes in the worm gear housing.

Capacity, Tons	Height, Inches	Lift, Inches	Dia. Base, Inches	Dia. Cap., Inches	Weight Each, Lbs.	Each
15	17	10	7	4¾	60	$60.00
25	17¼	10	8	5¼	70	90.00
35	17½	10	8	5¼	80	130.00
50	19	10	9	6½	146	150.00
75	20¼	10	9½	7½	203	225.00
100	22	10	10	8½	278	275.00

Note.—Only fifty per cent of rated capacity of jack can safely be carried on the toe.

SCREW JACKS

NORTON

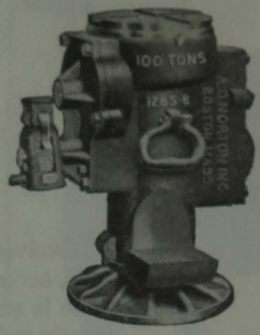


Fig. 2855

All ball bearing jacks have gears of solid steel forgings, machine cut. The gears are kept in perfect adjustment by means of the set screw underneath the cover; ratchet screw with ball bearings. It has no valves or packing, requires no filling or attention, and is always ready for instant use.

BRIDGE AND WRECKING

With Ball Bearings

Capacity, Tons	Height, Inches	Raise, Inches	Size of Base, Inches	Dia. Head, Inches	Weight Each, Lbs.	Each
15	22	10	8x 8	5½	115	$60.00
25	26	13	8x 9	5½	157	96.00
25	22	10	8x 9	5½	136	90.00
35	22	10	8x10	6½	190	130.00
35	26	13	8x10	6½	230	138.00
50	24	9	14	10½	270	130.00
50	26	12	14	10½	288	150.00
75	27	11	14	10½	340	200.00
100	27	11	14	10½	365	300.00

With Cone Bearings

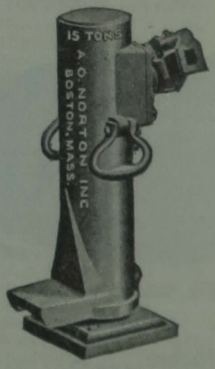


Fig. 2856

Made of malleable iron and steel, and have hardened tool steel bearings for end of screw. Are rated for head lift; not more than one-half the rated capacity should be lifted with the foot. A general purpose jack for carpenters and builders, boiler makers, truckmen, or for any work within its capacity.

General Purpose

Style	Capacity, Tons	Ht. Over All, Ins.	Raise, Ins.	Size of Base, Ins.	Wt. Each, Lbs.	Each
Y	10	20	8	7½x7½	98	$30.00
N. J.	10	14	5½	6 x10	65	28.00
G Plain	15	22	10	10	105	30.00
G with Foot	15	22	10	8 x8	110	32.00
G with Hook	15	22	10	100	110	38.00

SCREW JACKS

STANDARD SPEED—BALL BEARING

Fig. 2857

Made of malleable iron with parts of steel. The gears are drop forged from high carbon steel and have machine cut teeth. The raising screw is of crucible steel with a special thread and revolves in a bronze nut. Thrust on the bevel pinion is taken up by an anti-friction bearing, a special feature.

The ratchet arrangement consists of a malleable iron cage surrounding the ratchet wheel on the shaft. The cage holds a tool steel pawl pin which engages the teeth of the ratchet. Direction is changed by pulling out pin and turning it around halfway. Large alloy steel balls, each separate in a bronze cage working between two hardened and ground steel plates, make a most durable and lasting ball bearing. Furnished with foot lift. Suitable for work in repair shops yards and for general lifting purposes. The full rated capacity may be lifted on top of jack and one-half rated capacity on the toe for low set loads. Regular lever and small crank handle are furnished.

NOS.	66	60	67	61
Capacity, Tons	15	15	25	25
Height, Inches	22	26	22	27
Raise, Inches	10	13	10	13
Diameter Base, Inches	5x9	5x9	8x11	8x11
Diameter Head, Inches	5	5	6	6
Weight Complete, Lbs.	120	132	170	200
Each	$60.00	70.00	90.00	96.00

NOS.	68	62	64	91
Capacity, Tons	35	35	50	35
Height, Inches	22	26	27	26
Raise, Inches	10	13	13	13
Diameter Base, Inches	9x10½	9x10½	14	12
Diameter Head, Inches	6¾	6¾	10½	.....
Weight Complete, Lbs.	220	250	320	205
Each	$130.00	138.00	150.00	125.00

JOURNAL JACKS

BALL BEARING

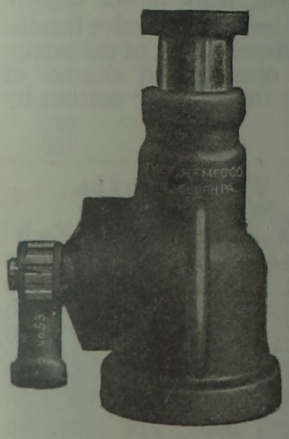


Fig. 2858

For removing and replacing journal brasses in locomotives, freight and passenger cars, etc. Of malleable iron. Gears cut from solid bar, have machine cut teeth, crucible steel screw, machined and heat treated. Inside case is packed with grease in which all parts revolve.

NOS.	52	53	159	259
Capacity, Tons	15	15	25	25
Height, Inches	11	9¾	9	11
Raise, Inches	5	4	3¼	5¼
Wgt. Each, Lbs.	33	31	50	55
Each	$22.00	22.00	35.00	35.00

SCREW JACKS

HIGH SPEED—BALL BEARING

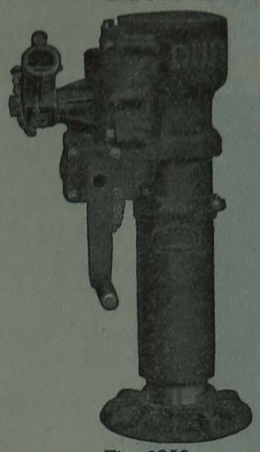


Fig. 2859

The head and base are steel castings; the stem and shell are of cold drawn steel. The screw is of special alloy steel heat treated and has double thread with one inch pitch. The nut is of bronze. The balls are large, of alloy steel, case hardened, and the bearing plates are of chrome nickel steel, also case hardened. The automatic clutch for retaining and lowering load is of alloy steel. The pinion shank bearing is lined with phosphor bronze which reduces friction and wear to a minimum.

Has worm gear which when fitted with crank handle, will allow fast raising and quick, easy lowering of load. Load is held mechanically by roller pin clutch which, unlike friction discs, always remains positive in action, regardless of wear.

NOS. 1574-1591

Designed for head lift and are adapted for handling railway equipment and for general lifting.

NOS.	1574	1577	1576	1573
Capacity, Tons	50	50	50	50
Height, Inches	36	30	26	24
Raise, Inches	24	17	14	12
Weight Each, Lbs.	270	302	235	228
Each	$220.00	200.00	180.00	180.00

NOS.	1575	1593	1592	1591
Capacity, Tons	50	35	35	35
Height, Inches	20	35	30	26
Raise, Inches	8	21	17	13
Weight Each, Lbs.	263	299	262	237
Each	$175.00	175.00	160.00	150.00

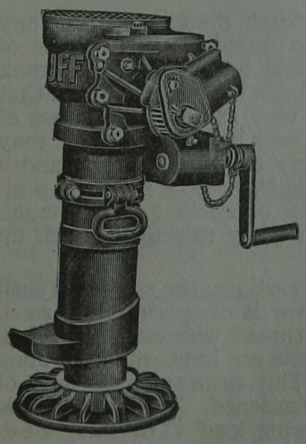


Fig. 2860

WITH TOE LIFT

Similar to above item but arranged for toe lift.

Has toe lift cast integral with shell for lifting low set loads. Built considerably heavier than the regular high speed jacks due to eccentric strain imposed when loads are lifted on toe.

NOS.	1664	1564	1562
Capacity, Tons	75	50	35
Height, Inches	26	26	26
Raise, Inches	12	14	13
Weight Each, Lbs.	350	295	211
Each	$325.00	200.00	165.00

HIGH SPEED SCREW JACKS

BALL BEARING

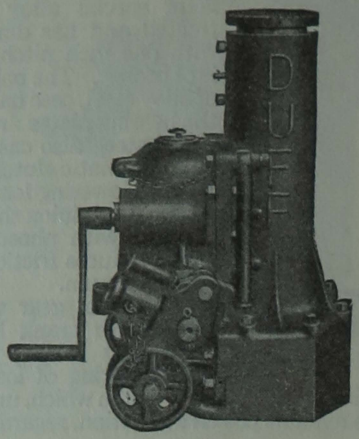


Fig. 2861

Particularly adapted for handling locomotives and other heavy railway equipment.

Operating mechanism, instead of being located in the head of the jack as is the case with all other screw jacks of this type, is placed in the base. The greater weight is thus put at the bottom instead of at the top, so that the jack is not top-heavy. The point at which the operating lever is pivoted does not rise with the load. This allows a full powerful stroke, regardless of the height of the load.

Unusually easy to move about. The concentration of weight in the base makes it easy to handle and by inserting the operating lever into special sockets, the jack can be tipped over by one man and wheeled on its own wheels to the location required.

Absolute safety is assured by a positive clutch which holds the load at all times, preventing any possibility of its slipping or sinking. A safety signal is provided to indicate when the jack has reached its maximum height. It is extremely rapid for a tool of its capacity, on account of its steep pitch double threaded screw and is simple to operate.

The fact that the holding clutch does not permit any appreciable sink-back assists in making every ounce of pressure applied to the elevating lever count. A crank handle is used for lowering. A few easy turns are all that are required as the action is very rapid. Regardless of the speed with which the load may be descending, it may be stopped with absolute safety to within a thousandth part of an inch of any point desired. The action is positive, so there is no possibility of sticking. The crank handle may also be used for rapidly raising the jack up to the load.

The head and base are steel castings, the stem and shell of cold drawn steel. The screw is of special alloy steel, heat treated, and has double thread with one inch pitch. The nut is of bronze. The balls are large, made of alloy steel and case hardened. The bearing plates are of chrome nickel steel, case hardened. The automatic clutch for retaining and lowering load is of alloy steel. The pinion shank bearing is lined with phosphor-bronze which reduces friction and wear to a minimum.

NOS.	7520	7524	7526
Capacity, Tons	75	75	75
Height, Inches	20	24	26
Raise, Inches	6	10	12
Weight Each, Lbs	410	425	440
Each	$300.00	300.00	300.00

HORIZONTAL HYDRAULIC JACKS

UNIVERSAL—DOUBLE PUMP

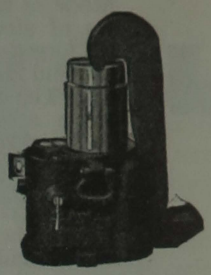


Fig. 2862

REMOVABLE CLAW TYPE

Can be operated either vertically or horizontally. Designed to meet the demand for a compact, lightweight hydraulic jack, easily handled, operated and controlled, adapted to meet the conditions imposed by the heavy and diversified lifting. Lifts both on the ram head in the usual manner and also by means of the claw where a lift close to the ground is necessary. It is provided with a specially designed cistern which gives a support and guide to the claw and prevents the crushing of the cistern either by the load on the claw or by the strain coming on the front of the cistern by reason of the load. This feature is not required for the smaller sizes.

When the load is light, the double pump will raise it with twice the speed of the single pump. When the load is heavy, a quarter turn of the valve handle will throw out one pump and give the action of a single pump jack.

Valves are in one valve chamber, and their number reduced. While other double pump jacks require three pressure valves and two suction valves, this has but one pressure valve and two suction valves, and of the suction valves but one is used at a time. While other double pump jacks have three passages between the pressure chamber and the reservoir, each closed by a single valve, the failure of any one rendering the jack inoperative, this jack has but one passage containing three valves, any one of which alone can perform the functions commonly shared by the three. This new feature is valuable for the reason that it removes all these objectionable complications of valves and passages which have heretofore impaired the advantages of other double pump jacks. A separate and independent lowering valve is not needed.

It can be lowered by either the lever or the valve handle. As the valves can be operated independently of the pumping mechanism, they may be opened and cleared of any obstruction which prevents their proper seating by working the pump.

NOS.	Capacity, Tons	Run Out, Inches	Height, Inches	Base, Inches	Weight Each Lbs. Without Claw	With Claw	Each
730	30	12	21	15 x11	290	351	$200.00
731	30	18	28	15 x11	350	433	235.00
732	40	12	22	15¾x11	332	418	240.00
733	40	18	28	15¾x11	370	480	280.00
734	50	12	23	16 x11½	414	534	260.00
735	50	18	28	16 x11½	475	565	310.00
736	60	9	19	18 x12½	485	607	250.00
737	60	12	23	18 x12½	590	718	275.00
738	60	18	30	18 x12½	650	771	350.00
739	80	9	21	19¾x14½	565	684	310.00
740	80	12	24	19¾x14½	665	795	335.00
741	80	18	31	19¾x14½	740	891	385.00
742	100	9	22	22 x16	735	946	375.00
743	100	12	25	22 x16	820	1042	400.00
744	100	18	32	22 x16	1025	1268	475.00

Prices for Removable Claws on Application

HYDRAULIC JACKS

UNIVERSAL—DOUBLE PUMP

Designed to be readily taken apart and reassembled; all parts are interchangeable, and worn parts may be easily replaced at small cost; double pumps, if the load is light, or if the ram must be extended some distance before strain commences, the two pumps can be used together until the strain becomes excessive, when one pump is thrown out by turn of the handle; jack can be operated either vertically or horizontally and with lever working at any angle; requires but one pressure valve for both pumping and lowering; cam, cam shaft and valve handle are cut from bar steel; cam is hardened to resist wear; push tube is a section of boiler tube with one end swaged to provide a seat for the spring and a contact for the valve; piston head is made from bar steel, machined cold and case hardened; lever arm is a solid steel drop-forging; valves of tool steel hardened and coated with nickel to prevent corrosion; valve seat is hardened steel.

PLAIN JACK

For use in presses or where there is a firm foundation or support.

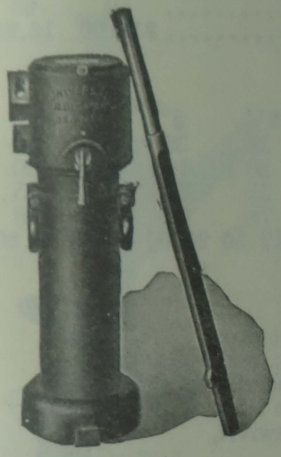


Fig. 2863

NOS.	Capacity, Tons	Run Out, Inches	Height, Inches	Diameter Base, Inches	Weight, Lbs.	Each
580	10	12	25	6	80	$80.00
581	10	18	32	6	98	95.00
582	10	24	39	6	110	110.00
583	15	12	26	6½	102	100.00
584	15	18	32	6½	120	125.00
585	15	24	39	6½	140	150.00
586	20	12	26	7	127	120.00
587	20	18	33	7	155	145.00
588	20	24	39	7	180	170.00
589	30	9	22	8	146	150.00
590	30	12	26	8	194	175.00
591	30	18	33	8	260	210.00
592	40	12	27	9	280	210.00
593	40	18	34	9	320	240.00
594	50	12	28	10	333	240.00
595	50	18	33	10	374	290.00
596	60	12	28	11	350	290.00

BASE JACK

For railroad work or where a broad base insuring stability is required. Construction and operation is otherwise similar to above jack.

NOS.	Capacity, Tons	Run Out, Inches	Height, Inches	Diameter Base, Inches	Weight, Lbs.	Each
614	10	12	25	11	109	$95.00
615	10	18	31	11	125	110.00
616	15	12	25	12	135	125.00
617	15	18	32	12	158	150.00
618	20	12	26	13½	168	150.00
619	20	18	32	13½	227	175.00
620	30	9	22	14	210	170.00
621	30	12	27	14	271	200.00
622	30	18	33	14	310	235.00
623	40	12	27	14½	340	240.00
624	40	18	35	14½	392	280.00
625	50	12	28	15½	427	260.00
626	50	18	36	15½	491	310.00
627	60	12	30	16	508	310.00

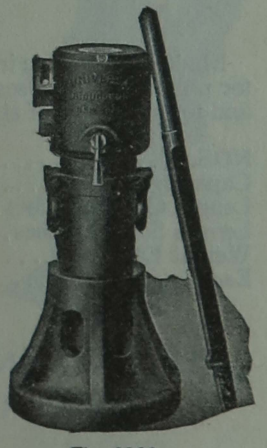


Fig. 2864

CLAW JACK

For general use and work that will not permit the head to be placed under the load. Construction and operation practically same as above types of jacks.

Fig. 2865

NOS.	Capacity, Tons	Run Out, Inches	Height, Inches	Weight, Lbs.	Each
629A	10	12	25	125	$100.00
629B	10	18	32	144	120.00
629C	15	12	26	162	150.00
629D	15	18	32	190	185.00
629E	20	12	26	203	200.00
629F	20	18	33	245	240.00
630	30	9	22	290	225.00
631	30	12	26	310	250.00
632	30	18	32	364	285.00
633	40	12	27	355	300.00
634	40	18	34	460	325.00
635	50	12	27	450	325.00

CABLE REEL JACKS

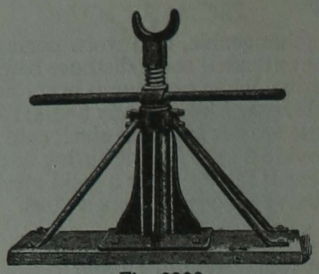


Fig. 2866

Will support cable reels of any size while the cable is being run off. The lever turns the nut which moves the screw upward. The forked head holds shafts 2½ inches in diameter; swivels to any position.

White oak base; cast iron stand; nut and swivel cap; wrought iron screw, braces and lever.

	Each
NO. 01—Height Over All, 27 Inches; Height of Stand, 20 Inches; Diameter of Screw, 2 Inches; Length of Thread Cut, 12 Inches; Width of Base, 12 Inches; Length of Base, 30 Inches; Weight Each, 98 Lbs.	$15.00

PULLING JACKS

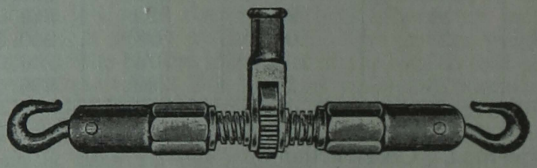


Fig. 2867

Made of malleable iron with steel screw and have hooks for pulling only. Used in repairing steel cars and trucks and for all classes of structural work.

NOS.	1	2
Capacity, Tons	7	10
Length Closed, Inches	33	33
Length Screw, Inches	12	12
Weight Each, Lbs.	35	50
Each	$17.50	22.50

PULLING AND PUSHING JACKS

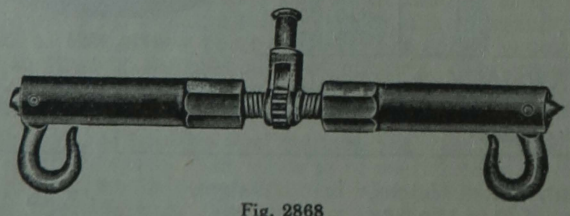


Fig. 2868

Made of malleable iron with steel screw, having hooks for pulling and points for pushing. Used in repairing cars and for all classes of structural work. Illustration shows hooks lowered for pushing. Hooks are raised when jack is used for pulling.

NOS.	3	4
Capacity, Tons	7	10
Length Closed, Inches	33	33
Length Screw, Inches	12	12
Weight Each, Lbs.	45	93
Each	$17.50	22.50

TOBACCO JACK SCREWS

Fig. 2869

Wing base, reinforced; wrought iron screw; cast iron base and cap. The metal base is distributed so as to give greatest possible strength; swivel, corrugated top.

Diameter Screw, Inches	2½	2½
Capacity, Tons	28	28
Height Stand, Inches	16	18
Height Over All, Inches	21	23
Weight Each, Lbs	59	63
Each	$15.00	16.25

Diameter Screw, Inches	2½	3	3	3
Capacity, Tons	28	36	26	36
Height Stand, Inches	20	16	18	20
Height Over All, Inches	25	21	23	25
Weight Each, Lbs.	78	79	84	98
Each	$17.50	25.00	26.75	28.50

Wing base; ratchet; wrought iron screw; cast iron base and cap; malleable iron ratchet, pawl and handle. The metal base is disbributed so as to give greatest possible strength; swivel, corrugated top.

Diam. Screw, Inches	2½	2½
Capacity, Tons	28	28
Height Stand, Inches	16	18
Height Over All, Inches	22	24
Weight Each, Lbs.	62	66
Each	$36.00	38.00

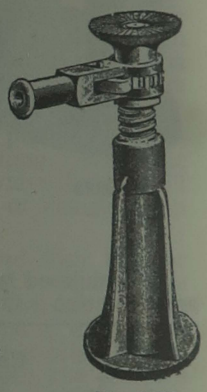


Fig. 2870

Diameter Screw, Inches	2½	3	3	3
Capacity, Tons	28	36	36	36
Height Stand, Inches	20	16	18	20
Height Over All, Inches	26	22	24	26
Weight Each, Lbs.	82	86	92	107
Each	$40.00	48.50	50.00	52.00

TELESCOPE SCREW JACKS

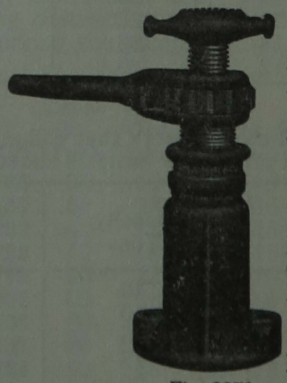


Fig. 2871

Can be used in close quarters and will raise twice as rapidly as an ordinary jack.

Base is made of cast iron and contains a machine cut nut in which the screw travels. The screw is cut from finest machinery steel.

NOS.	11	12
Capacity, Tons.	15	15
Height Closed, Ins.	8	10
Raise, Inches	7	9
Weight Each, Lbs.	40	45
Each	$22.00	25.00

NOS.	13	14	15	16
Capacity, Tons	20	25	30	40
Height Closed, Inches	13	16	16	19
Raise, Inches	14	18	17	22
Weight Each, Lbs.	64	75	85	127
Each	$30.00	34.00	40.00	45.00

TRIP OR TRACK LEVER JACKS

BARRETT

Used for constructing, surfacing and ballasting track. The rail may be dropped instantly on the approach of trains. Meets requirements of roadmasters' association of America. The base or frame is made of refined malleable iron; rack is forged steel; socket lever is made of steel in one piece; pawls drop forged from open hearth machinery steel.

Fig. 2872

Double acting, raising load, both on the upward and downward stroke of lever.

NO.	1
Capacity, Tons.	10
Height, Inches.	24
Raise, Inches.	13
Size Bar, Inches.	1½x1½
Weight Complete, Lbs.	70
Each	**$22.00**

Single acting; raises load on downward stroke only; otherwise, same as the No. 1.

NO.	17
Capacity, Tons	10
Height, Inches	24
Raise, Inches	13
Bar, Inches	1½x1½
Weight Complete, Lbs.	70
Each	**$22.00**

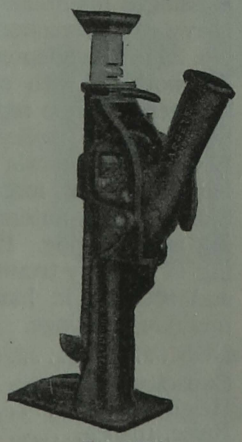


Fig. 2873

Fig. 2874

Of the same construction as the No. 1, but with heavier standard and wider base and corresponding greater capacity. Is single acting, raising the load on downward stroke only.

NO.	7
Capacity, Tons.	15
Height, Inches.	24
Raise, Inches.	13¾
Bar, Inches.	1⅝x1⅞
Weight Complete, Lbs.	106
Each	$32.00

AUTOMATIC LOWERING JACKS

BARRETT

Designed for use of truckmen, contractors, mines, railways and for general lifting. Double acting, raising or lowering load on upward and downward stroke of lever; load is lowered gradually notch by notch. Direction is controlled by eccentric at side of frame.

Fig. 2875

Malleable iron frame and base; drop forged, open hearth, high carbon steel pawls; forged steel rack, machine cut teeth; high carbon, rolled steel fulcrum pin; turned handles, selected ash or hickory.

NOS.	50	2
Capacity, Tons.	5	10
Height, Inches.	16	21
Raise, Inches.	8	10
Size Bar, Inches.	1¼	1⅝x1⅝
Weight Complete, Lbs.	35	70
Each	**$16.00**	**25.00**

NOS.	10	3	4
Capacity, Tons	10	12	15
Height, Inches	24½	26½	22
Raise, Inches	14	15	10
Size Bar, Inches	1½x1½	1¾x1⅞	2x2
Weight Complete, Lbs.	75	100	106
Each	**$30.00**	**30.00**	**35.00**

No. 10 has combined trip and automatic lowering device; Nos. 2, 3, 4, 5 will operate at any angle.

Similar construction as jacks listed above, but single acting, raising and lowering on downward stroke only.

NOS.	18	219
Capacity, Tons.	10	15
Height, Inches.	21	28½
Raise, Inches.	10	17½
Size Bar, Inches.	1½x1⅝	2¼x1¾
Weight Complete, Lbs.	75	105
Each	**$25.00**	**40.00**

Fig. 2876

EMERGENCY JACKS

BARRETT

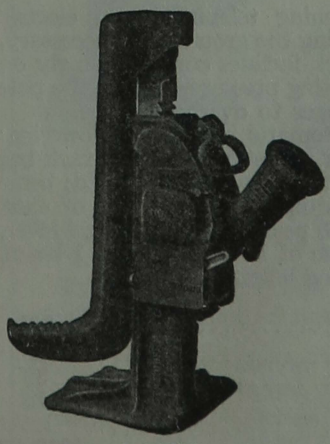


Fig. 2877

Constructed of the same high grade material as the automatic lowering jacks. Single acting, has drop forged steel claw, fastened to top of rack by ball and socket joint so that it is free to swivel sideways, 120 degrees, and out from the base when set in an inclined position. Full capacity of jack may be lifted on the claw.

NO.	239
Capacity, Tons.	15
Height Top, Inches	22
Height Toe, Inches	3
Raise, Inches.	10½
Weight Each, Lbs.	110
Each	**$55.00**

EMERGENCY JACKS

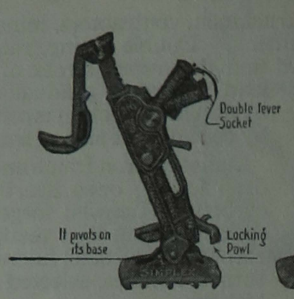


Fig. 2878

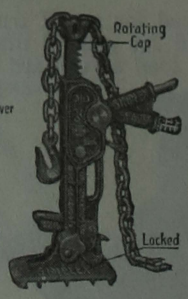


Fig. 2879

Used extensively by coal mines, lumber companies, machine and boiler works, for oil well operations and all-round utility work; pivots on its base; pushes and pulls as well as lifts and lowers; can be used for vertical raising and lowering, or by releasing the locking pawl it can be tilted at an angle. Heavy calks on base prevent slipping. Heavy, malleable iron base; steel lever socket; drop forged pawls; hardened steel bushings and keys. Furnished with a five-foot steel chain, auxiliary shoe and five-foot steel pinch bar. Steel chain, can be fitted on the rotating cap at any link; and permits grappling of loads in awkward or difficult positions or in restricted areas.

NO.	310
Lift, Inches	12½
Height, Inches	21½
Capacity, Tons	15
Weight Each, Lbs.	89
Each	$52.00

POLE PULLING AND STRAIGHTENING JACKS

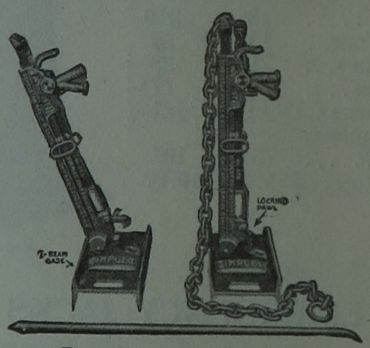


Fig. 2880

Fig. 2881

For pulling or straightening telephone and electric line poles; digging or softening the ground is unnecessary. As the pole inclines the jack inclines correspondingly on its pivot base without releasing pressure, so that the pole can be guided without danger to overhead wires.

Jack is single acting, automatic raising and lowering; base is malleable iron; lever socket drop forged; rack bar of chrome nickel steel forging; pawls, drop forged; bearings of hardened steel. Equipped with 8 feet of scarf welded steel chain fitted with pear links; 5-foot steel lever, heat treated; auxiliary base of 10 inch, 24 lbs. I-beam, 2 feet long with punched hand holes.

NO.	328
Lift, Inches	23
Height, Inches	39
Capacity, Tons	15
Weight Each, Lbs.	187
Each	$70.00

MINE AND INDUSTRIAL JACKS

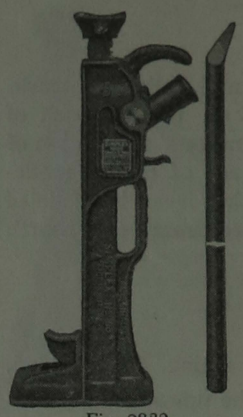


Fig. 2882

SIMPLEX

SINGLE ACTING

Designed for handling mining machinery, mine cars, agricultural machinery, light and narrow gauge track and general industrial service. Single acting automatic lowering and raising. Made of malleable iron with working parts of drop forged steel. Nos. 85, 86 models are furnished with steel pinch bar.

NOS.	85	86
Capacity, Tons	5	5
Height, Inches	17	20¼
Raise, Inches	10½	14
Weight Each, Lbs.	30	34
Each	$15.00	16.00

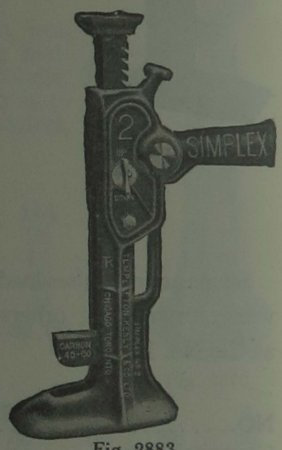


Fig. 2883

Used by electrical and steam railroads, contractors and in general industrial service. No. 2 is adapted for electric railway and contractors use and for car body and truck purpose; No. 24 is designed for bridge, frog and crossing maintenance and heavy construction work; No. 29 is best adapted for high lift work as with car bodies and general shop repair work. Standards of malleable iron. Lever socket, pawls and rack bar of drop forged steel. Single acting, automatic raising and lowering. Each bearing is a heavy trunnion cast integral with fewer sockets and rotating in hardened steel. Closed end lubricant retaining bushings.

NOS.	2	24	29
Capacity, Tons	10	15	15
Height, Inches	20½	23	28½
Raise, Inches	12	14	19
Weight Each, Lbs.	56	87	100
Each	$25.00	35.00	35.00

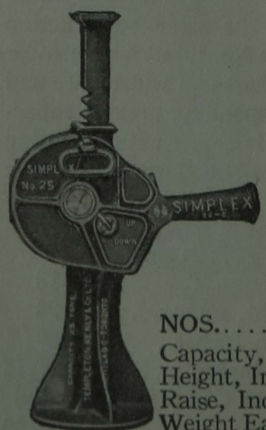


Fig. 2884

GEARED CAR JACKS

Designed for easy handling of railroad cars, locomotives, coaches and for heavy industrial service. Single acting, automatic in raising and lowering. Made of malleable iron with drop forged steel gear and pinion; chrome vanadium steel pawls, crucible steel lever socket and hardened steel bearings.

NOS.	25	35	40
Capacity, Tons	25	35	40
Height, Inches	27	26½	37
Raise, Inches	16½	26½	26½
Weight Each, Lbs.	150	200	260
Each	$100.00	135.00	175.00

AUTOMOBILE JACKS

LANE—REGULAR

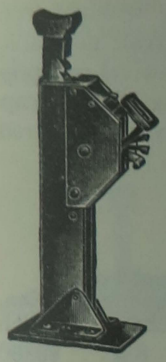


Fig. 2885

Easy-lifting jack of the short-handle variety; lift bar of solid wrought steel, with notches milled out; frame, plated steel of ample thickness and well braced; springs made of piano steel wire; reverse lever on left side of handle socket; quick release levers on right side. By pinching levers together lift bar may be lowered without ratcheting, but only when not under load; handle, 15 to 17 inches long; wrought steel, with flange flat bearing for hand.

NOS.	Lifting Capacity, Lbs.	Height Lowered, Inches	Height Extended, Inches	Weight Each Lbs.	Each
04	3000	9¼	14¾	5¼	$2.75
4	3000	10	16¼	5½	2.75
06	5500	9½	15	7½	3.50
6	5500	10¼	16½	8	3.50

KIMBALL—BALL-BEARING

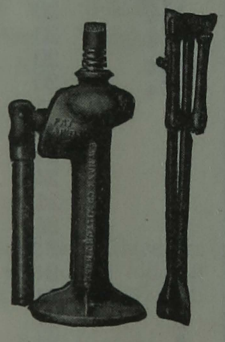


Fig. 2886

Long handle permits lifting any car without getting under it; diamond point hardened steel top with its bull-dog grip holds anywhere, on any bolt, spring or clip. Ball bearings carry the lift and reduce friction, making jack exceedingly easy of operation; no pawls, no ratchets, no kick back; operation of jack is adjusted by twisting the handle. Ball socket holds handle rigid while sliding jack under car and prevents it from falling over; nothing to get out of order; folds up; come packed in a small bag; takes up little space in tool box; it is so constructed as to allow it free use in limited and inaccessible positions where the use of other types of jacks is impossible.

NOS.	Height, Lowered Inches	Height, Extended Inches	Weight Each, Lbs.	Each
1	9	15	9	$7.00
3	11	18	10	7.00
4	12	20	10½	7.00

Length of handles, 29½ inches.

BALL BEARING HEAVY TYPE FOR AUTO TRUCKS

	Each
NO. 5—With 44-Inch Handle; Weight Each, 23 Lbs.	$15.00
Extra 18-Inch handle Sections	1.00

AUTOMOBILE JACKS

HARTFORD

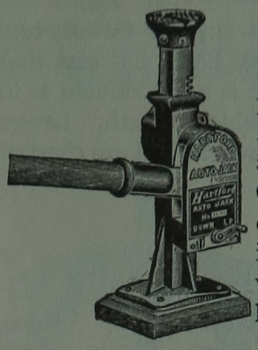


Fig. 2887

Compact and easy working, capable of lifting 1,000 pounds, with a pressure of 15 pounds on the handle. Has a long handle for convenience, and a short stroke for safety. Gears are cut from tough steel and case hardened; malleable iron casing, black japanned; broad hardwood base and 1½-inch hickory handle.

NOS.	Height, Inches	Lift, Inches	Weight Each, Lbs.	Each
H	10½	6	15	$9.00

BARRETT

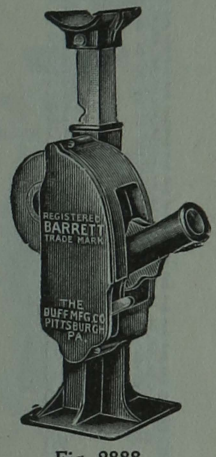


Fig. 2888

Designed for motor truck and garage use. Malleable iron frame and base; high carbon drop forged open hearth steel pawls; forged steel rack; machine cut teeth. The leverage is so compounded by gears that the load is lifted with only one third the effort required with direct leverage.

NOS.	Capacity, Tons	Height, Inches	Raise, Inches	Weight Each, Lbs.	Each
100	3	10¾	5¼	16	$8.00
300	5	13	6¾	30	.....

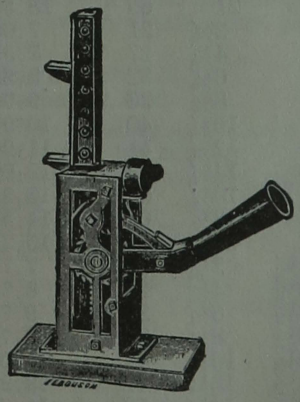


Fig. 2889
Plain

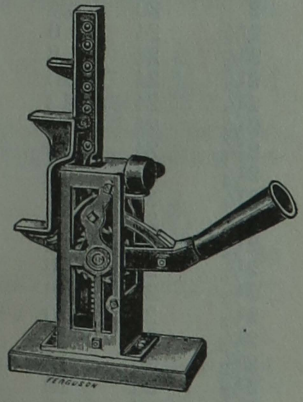


Fig. 2890
With Drop Hook

SAMSON

Made of malleable iron and mounted on heavy hardwood block. Built for raising extra heavy trucks.

NOS.	Height Closed, Inches	Height Raised, Inches	Weight Each, Lbs.	Without Drop Hook, Each	With Hook, Each
4	28	33	45	$12.00	$14.00

BELL BOTTOM JACK SCREWS

Fig. 2891

REGULAR

Wrought iron screw with cut thread; cast iron base with forged head and cast iron cap; metal in the base is so distributed as to give the greatest possible strength. Levers are sent only when ordered and are charged extra.

Dia. of Screw, Inches	Capacity, Tons	Height of Stand, Inches	Height Over All, Inches	Rise of Screw, Inches	Weight Each, Lbs.	Price, Each
1¼	10	4	6¾	2¼	8	$2.90
1¼	10	6	8¾	4¼	8½	3.10
1¼	10	8	10¾	6¼	12½	3.40
1¼	10	10	12¾	8¼	14	3.80
1¼	10	12	14¾	10¼	18½	4.20
1¼	10	14	16¾	12¼	21½	4.60
1½	12	4	7	1¾	10	3.25
1½	12	6	9	3¾	13	3.75
1½	12	8	11	5¾	16	4.25
1½	12	10	13	7¾	18	4.75
1½	12	12	15	9¾	20	5.25
1½	12	14	17	11¾	25	6.00
1½	12	16	19	13¾	28	6.75
1¾	16	5	8	2½	13	4.25
1¾	16	6	9½	3½	15	4.50
1¾	16	8	11½	5½	20	5.00
1¾	16	10	13½	7½	22	5.75
1¾	16	12	15½	9½	26	6.25
1¾	16	14	17½	11½	32	6.75
1¾	16	16	19½	13½	36	7.50
1¾	16	18	21½	15½	37	8.50
2	20	5	9	2	18	5.00
2	20	6	10	3	19	5.25
2	20	8	12	5	22	6.00
2	20	10	14	7	28	6.75
2	20	12	16	9	29	7.50
2	20	14	18	11	33	8.25
2	20	16	20	13	43	9.25
2	20	18	22	15	44	10.25
2	20	20	24	17	48	11.50
2	20	22	26	19	52	12.50
2	20	24	28	21	65	13.50
2¼	24	6	10	2¾	21	7.00
2¼	24	8	12	4¾	27	7.50
2¼	24	10	14	6¾	32	8.25
2¼	24	12	16	8¾	36	9.00
2¼	24	14	18	10¾	40	10.00
2¼	24	16	20	12¾	41	11.00
2¼	24	18	22	14¾	48	12.00
2¼	24	20	24	16¾	60	13.25
2¼	24	22	26	18¾	64	14.50
2¼	24	24	28	20¾	76	15.75
2½	28	6	10½	2¼	25	7.75
2½	28	8	12½	4¼	28	8.75
2½	28	10	14½	6¼	32	9.75
2½	28	12	16½	8¼	36½	10.75
2½	28	14	18½	10¼	44	12.00
2½	28	16	20½	12¼	47	13.25
2½	28	18	22½	14¼	52	14.50
2½	28	20	24½	16¼	60	15.75
2½	28	22	26½	18¼	68	17.00
2½	28	24	28½	20¼	77	18.25
2½	28	28	32½	24¼	107	22.00
2½	28	32	36½	28¼	110	26.00
3	36	14	18½	9½	61	19.50
3	36	16	20½	11½	72	20.75
3	36	18	22½	13½	80	22.00
3	36	20	24½	15½	89	23.25
3	36	22	26½	17½	111	24.50
3	36	24	28½	19½	111	25.75
3	36	30	34½	25½	116	30.00

BELL BOTTOM JACK SCREWS

Fig. 2892

RATCHET

Base and cap of cast iron; wrought iron screw with steel ratchet and pawl; malleable iron lever socket; closed top swivel cap prevents dirt or grit from getting between cap and screw. Levers are sent only when ordered and are charged extra.

Dia. of Screw, Inches	Capacity, Tons	Height of Stand, Inches	Height Over All, Inches	Weight Each, Lbs.	Price, Each
1¼	12	4	7¼	8	$9.80
1¼	12	6	9¼	10¾	10.10
1¼	12	8	11¼	12	10.40
1¼	12	10	13¼	14	10.80
1¼	12	12	15¼	16	11.20
1¼	12	14	17¼	18½	11.60
1½	16	4	7½	11¼	11.25
1½	16	6	9½	14	11.75
1½	16	8	11½	15¾	12.25
1½	16	10	13½	18¼	12.75
1½	16	12	15½	21½	13.25
1½	16	14	17½	26½	14.00
1½	16	16	19½	32	14.75
1¾	20	5	9	13	13.25
1¾	20	6	10	19	13.50
1¾	20	8	12	22	14.00
1¾	20	10	14	25	14.75
1¾	20	12	16	28	15.25
1¾	20	14	18	33	15.75
1¾	20	16	20	39	16.50
1¾	20	18	22	45	17.50
2	24	5	9	21	14.50
2	24	6	10	23	15.25
2	24	8	12	26	16.00
2	24	10	14	28½	16.75
2	24	12	16	31	17.50
2	24	14	18	34	18.25
2	24	16	20	46	19.00
2	24	18	22	51	19.75
2	24	20	24	55	20.50
2	24	22	26	58	21.55
2	24	24	28	66	22.50
2¼	28	6	12	26	18.00
2¼	28	8	14	30½	19.00
2¼	28	10	16	36¾	20.00
2¼	28	12	18	42	21.00
2¼	28	14	20	45	22.00
2¼	28	16	22	50	23.00
2¼	28	18	24	57	24.00
2¼	28	20	26	62½	25.00
2¼	28	22	28	62¾	26.00
2¼	28	24	30	95	27.00
2½	32	6	12	35	19.50
2½	32	8	14	39	20.50
2½	32	10	16	44	21.50
2½	32	12	18	51	22.50
2½	32	14	20	55	23.50
2½	32	16	22	69	24.50
2½	32	18	24	74	25.50
2½	32	20	26	94	26.50
2½	32	22	28	..	27.75
2½	32	24	30	..	29.00
2½	32	28	34	..	33.00
2½	32	32	38	..	37.00
3	40	14	20	75	32.00
3	40	16	22	76	33.50
3	40	18	24	83	35.00
3	40	20	26	98	37.00
3	40	22	28	114	38.50
3	40	24	30	119	40.00
4	40	30	36	145	48.00

WHEEL AND GEAR PULLERS

CRANE

Used for quickly and safely removing automobile and truck wheels, gears, flywheels, cams, collars, sprockets, etc., and for bending pipe and straightening shafting. Built of the best material and designed to withstand rough usage. Made in four different sizes and in three styles: two-arm pullers, three-arm pullers and a combined two and three-arm style puller known as the crowfoot puller. All are equipped with locking arms which will not slip off work when puller is operated.

PULLERS

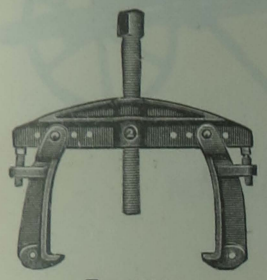


Fig. 2893
Two-Arm Puller

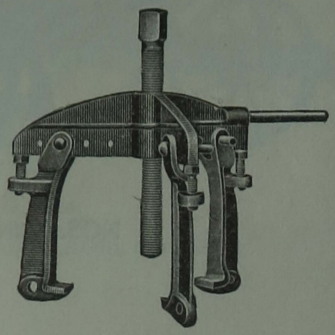


Fig. 2894
Three-Arm Puller

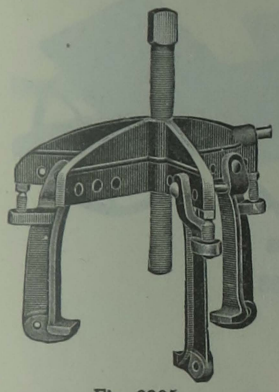


Fig. 2895
Crowfoot Puller

NO. 0 PULLERS

For small light work. Made in two-arm style only.

	Each
NO. 0—Two Arms; Capacity up to 6 Inches; with One Set, 3-Inch Locking Arms; Weight Each, 2½ Lbs.	$2.50

NO. 2 PULLERS

For garage use on medium weight cars. Takes diameters up to 11 inches. Equipped with one set 6-inch locking arms, one set 10-inch or one set 6 and one set 10-inch locking arms.

Length Arms, Inches	2-Arm, Weight Lbs.	Each	3-Arm, Weight Lbs.	Each	Crowfoot, Weight Lbs.	Each
6	14½	$6.80	20	$8.80	21½	$9.60
10	16¼	7.60	22½	10.00	24	10.80
610	20½	9.60	29	13.00	30½	13.80

NO. 3 PULLERS

For heavy car and truck use. Takes diameters up to 16 inches. Equipped with one set 7-inch locking arms, one set 11-inch, or one set 7-inch and one set 11-inch locking arms.

Length Arms, Inches	2-Arm, Weight Lbs.	Each	3-Arm, Weight Lbs.	Each	Crowfoot, Weight Lbs.	Each
7	24	$8.40	32	$10.80	35	$12.30
11	25½	9.20	35	12.00	38	13.50
7–11	31½	11.60	44	15.60	47	17.10

NO. 3X PULLERS

For work of large diameter. Two-arm puller takes diameters up to 20 inches; three-arm puller up to 26 inches. Other equipment same as for No. 3 pullers.

Length Arms, Inches	2-Arm, Weight Lbs.	Each	3-Arm, Weight Lbs.	Each
7	27½	$10.40	63	$18.16
11	29½	11.20	66	19.36
7–11	35½	13.60	74½	22.96

ATTACHMENTS

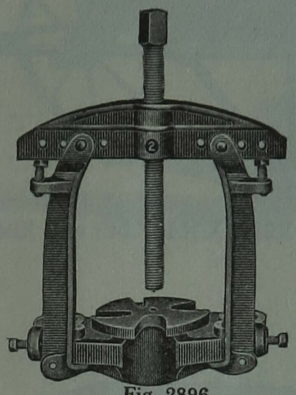


Fig. 2896
Arbor Press Base Attachment

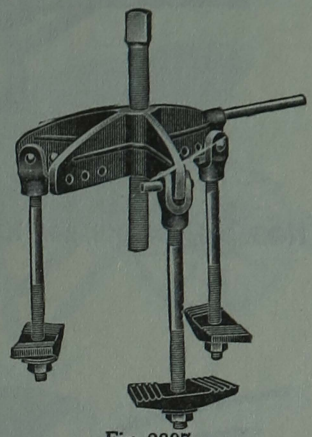


Fig. 2897
Heavy Truck Wheel Attachment

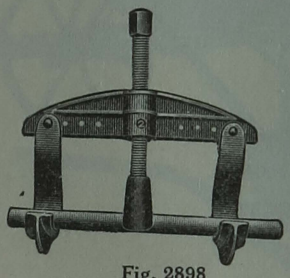


Fig. 2898
Pipe Bending Attachment

Fig. 2899
Stud Fork Attachment

Arbor Press Base Attachment makes a powerful arbor press with a two-arm or crowfoot puller. Bolts to bench. Puller is attached by two case-hardened set screws.

NOS.	2	3
Weight Each, Lbs.	17	36
Attachment, Each	$5.50	7.50

Stud Fork Attachment used with any puller for removing solid web flywheels, gears, etc.

NOS.	0	2	3
Weight Each, Lbs.	¼	¾	1¼
Attachment, Each	$0.30	.75	1.00

Pipe Bending Attachment used with two-arm or crowfoot puller for bending pipe, straightening shafting and removing universal joint yokes.

NOS.	2	3
Weight Each, Lbs.	6¾	10
Attachment, Each	$2.75	3.50

Heavy Truck Wheel Attachment for removing heavy spoked wheels. Used with any style puller.

NOS.	2	2	3	3
Style	2-Arm	3-Arm	2-Arm	3-Arm
Weight Each, Lbs.	7	10½	11½	17½
Attachment, Each	$3.20	4.80	5.60	8.40

REPAIR PARTS

NOS.	2	3	3X
Screws, Each	$2.00	$2.20	.....
Locking Arms 6 Inch, Each	1.00	.....	.....
Locking Arms 7 Inch, Each	.....	1.20	.....
Locking Arms 10 Inch, Each	1.40	.....	.....
Locking Arms 11 Inch, Each	.....	1.60	.....
Two-Arm Beams, Each	2.56	3.56	$5.56
Three-Arm Beams, Each	3.34	4.44	12.00
Crowfoot Beams, Each	4.14	5.94	.....
Pins	0.06	0.06	.....

TUBULAR STEEL WHEELBARROWS

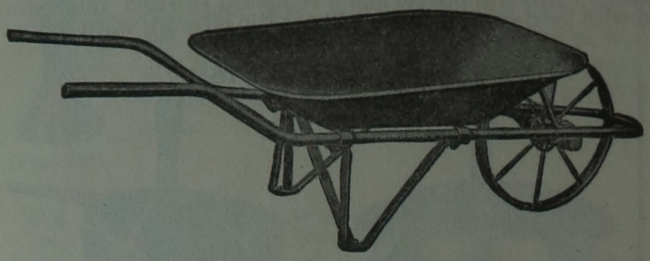


Fig. 2900

NOS. 236, 234, 246, 244, X234, X232, X244, X242 and X240

Fig. 2901

NOS. X264 and X260

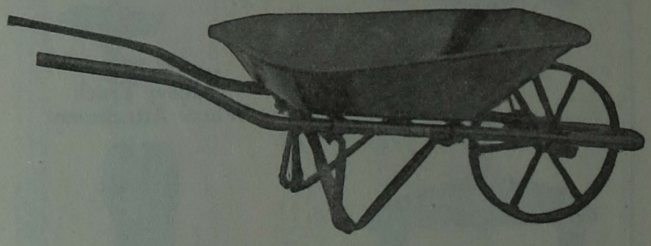


Fig. 2902

NO. O237

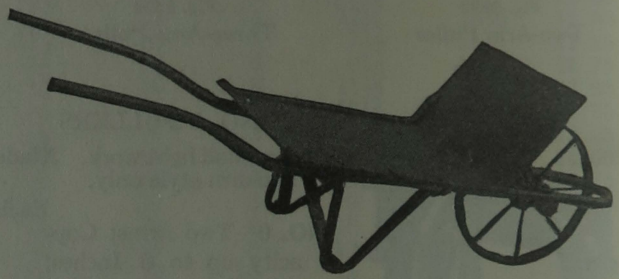


Fig. 2903

NO. X203

Nos. 236 and 246 are intended for sand, gravel and light materials. Nos. 234, 244, X234 and X244 are intended for general mill and factory purposes. Nos. X232, X242 and X240 are intended for mining and foundry use.

No. X264 is intended for handling coal, coke and bulky materials. No. X260 is a heavy 6 cubic foot mining and foundry barrow.

No. 0237 is a very light 3 cubic foot barrow used in the export trade.

No. X203 is intended for handling pig iron etc., in ingots or slabs.

NOS.	Size of Tray, Inches				Capacity Cubic Feet	Tray Gauge No.	Wheel No.	Approx. Weight, Pounds	Each
	Length On Top	Width On Top	Depth At Wheel	Depth At Handles					
236	33	28	7	4½	3	16	8	65	$14.45
246	35½	28½	8½	6	4	16	8	68	15.20
234	33	28	7	4½	3	14	10	71	15.85
244	35½	28½	8½	6	4	14	10	74	16.70
O237	33	28	7	4½	3	18	5	47	11.60
X234	33	28	7	4½	3	14	10	75	16.20
X244	35½	28½	8½	6	4	14	10	78	17.10
X232	33	28	7	4½	3	12	10	82	18.35
X242	35½	28½	8½	6	4	12	12	87	19.85
X240	35½	28½	8½	6	4	10	22	115	26.35
X264	41½	33	11½	8	6	14	12	90	21.20
X260	41½	33	11½	8	6	10	22	133	31.35

NO.	Size of Tray, Inches				Wheel No.	Approx. Weight, Pounds	Each
	Length of Bottom	Width of Bottom	Height of Dash	Thickness of Steel			
X203	23	22	13	¼	12	130	$23.25

CONCRETE WHEELBARROWS

Fig. 2904

NOS. A636, A634, A646, and A644

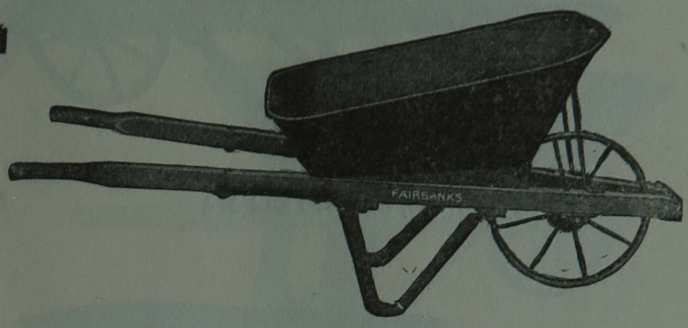


Fig. 2905

NO. A646C

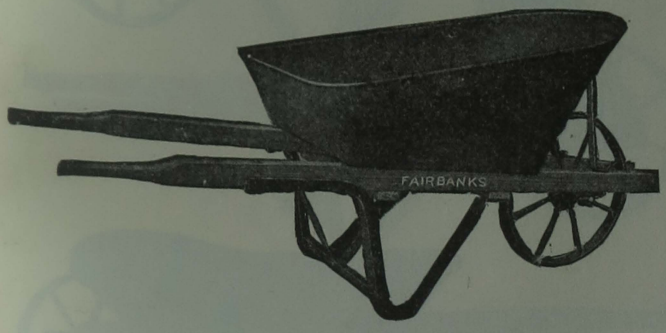


Fig. 2906

NO. 646D

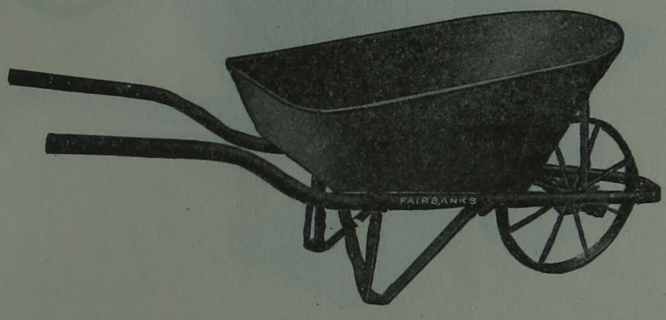


Fig. 2907

NO. 246D

Nos. A636, A634, A646 and A644 are intended for handling mortar, concrete and other sloppy materials. Tray is pressed from a single sheet of high carbon steel.

No. A646C is intended for the same purposes as the A636, etc., barrow. The tray is folded and fully electrically welded.

No. 646D is another concrete barrow, tray being very narrow and deep. Your attention is called to the extension on the leg.

No. 246D is the same as the No. 646D except handles are of tubing.

NOS.	Size of Tray, Inches				Capacity Cubic feet	Tray Gauge No.	Wheel No.	Approx. Weight, Pounds	Each
	Length On Top	Width On Top	Depth At Wheel	Depth At Handles					
A636	33	28	7	4½	3	16	8	62	$13 50
A646	35½	28½	8½	6	4	16	8	65	14 30
A634	33	28	7	4½	3	14	10	68	14 90
A644	35½	28½	8½	6	4	14	10	71	15.80
A646C	35	27¼	11½	7½	4	16	8	71	16.40
646D	36½	24½	14	8¼	4	16	8	72	17.00
246D	36½	24½	14	8¼	4	16	8	76	18.45

CONTRACTORS' WHEELBARROWS

Fig. 2908

NOS. 636, 634, 646 and 644

Fig. 2909

NO. 664

Fig. 2910

NOS. 336 and 346

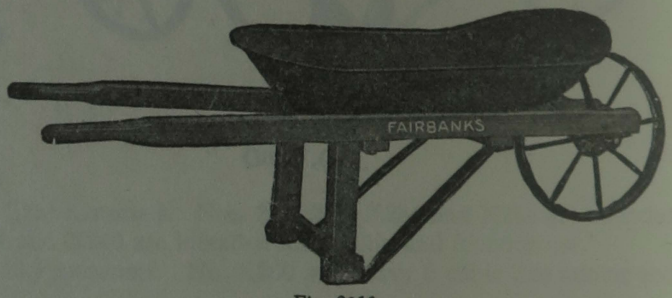


Fig. 2911

No. 345P

Nos. 636, 634, 646 and 644 end dump barrows are general purpose contractors' barrows for handling brick, sand, gravel, etc.

No. 664 is a 6 cubic foot barrow for handling coal, coke and similar bulky materials. Call your special attention to the angle iron extensions on the legs.

Nos. 336 and 346 are side dumps and are intended for the same purposes as the 636, etc.

No. 345 P has a pan-shaped tray and is intended for general contractors' use.

NOS.	Size of Tray, Inches				Capacity Cubic Feet	Tray Gauge No.	Wheel No.	Approx. Weight, Pounds	Each
	Length On Top	Width On Top	Depth At Wheel	Depth At Handles					
636	33	28	7	4½	3	16	8	61	$13.00
646	35½	28½	8½	6	4	16	8	64	13.80
634	33	28	7	4½	3	14	10	67	14.40
644	35½	28½	8½	6	4	14	10	70	15.30
664	41½	33	11½	8	6	14	12	83	19.35
336	33	28	7	4½	3	16	8	55	11.80
346	35½	28½	8½	6	4	16	8	58	12.55
345P	32	33	11	7½	4	16	8	60	13.65

SPECIAL PURPOSE WHEELBARROWS

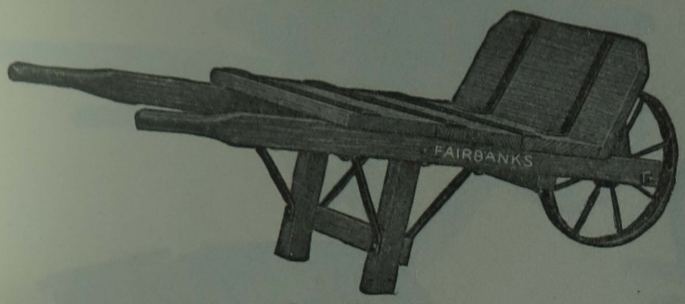


Fig. 2912
NO. 61

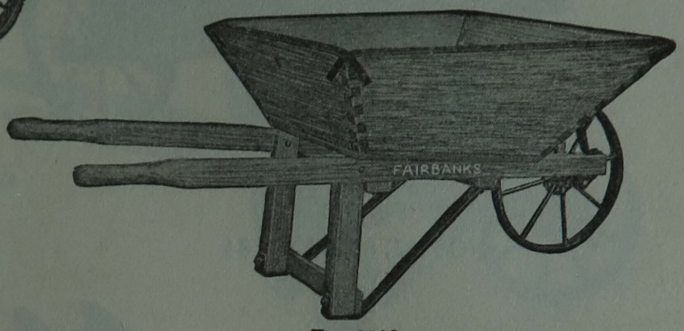


Fig. 2913
NOS. 33, 34 and 35

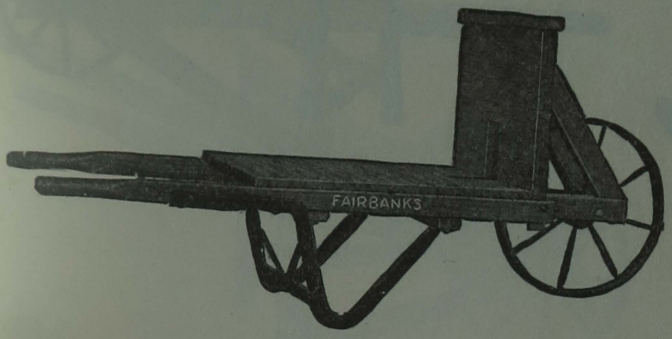


Fig. 2914
NO. 60

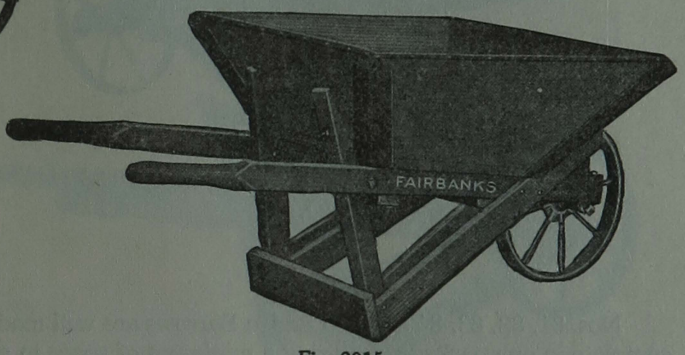


Fig. 2915
NO. 50

Nos. 33, 34 and 35 are intended for handling ore, oysters, fertilizer, sawdust and similar bulky materials.
No. 50 is intended for the fertilizer and phosphate trade. Box reinforced at corners with iron plates.
No. 60 is intended for tile (when wheel is on outside of dash).
No. 61 is intended for handling stone, pig iron, castings, etc. The floor and dash is iron strapped.

Nos.	Size of Tray, Inches							Wheel No.	Approx. Weight, Pounds	Each
	Length On Top	Width On Top, Front	Width On Top, Back	Depth At Wheel	Depth At Handles	Length At Bottom	Width At Bottom			
33	30¼	30½	25½	13	8¼	18½	17	8	58	$ 9.10
34	32¾	33	28½	15	10¾	18½	17	8	64	10.85
35	39½	41	33	22¾	14½	18¼	17	8	77	13.15
50	35½	35½	31	17¼	13	18½	18½	12	78	13.10

NO.	Dimensions, Inches				Wheel No.	Approx. Weight, Pounds	Each
	Length of Bottom	Width of Bottom	Width of Dash	Height of Dash			
60	29	24	24	19	16	80	$12.45
61	27	23	23	10	12	76	14.70

GARDEN AND STAVE WHEELBARROWS

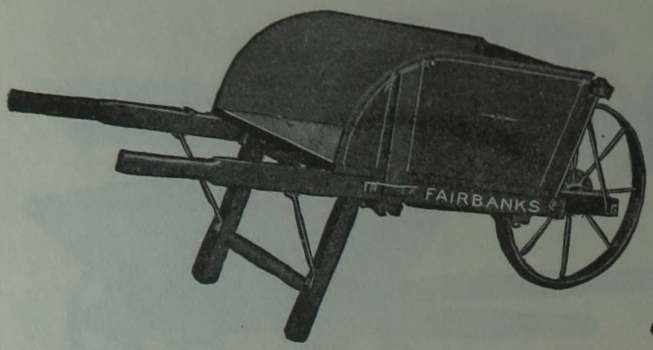


Fig. 2916

NOS. 81, 82, 83 and 84

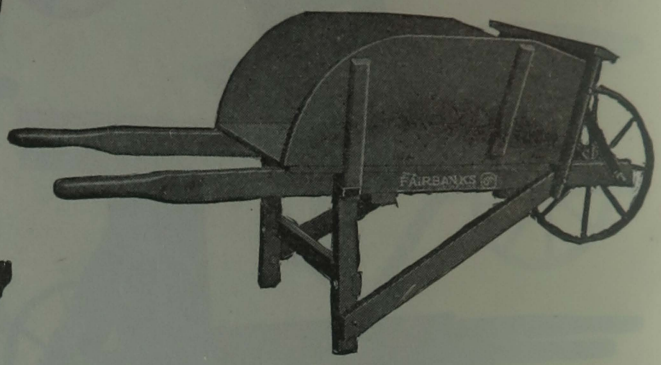


Fig. 2917

NO. 90

Fig. 2918

NO. 65

Nos. 81, 82, 83, 84 and 90 Garden Barrows are well made throughout. Removable side boards. Each barrow complete in one package, requiring a minimum of space in storing and shipping. Painted green and varnished.

No. 65 is intended for staves, bark, bales and boxes.

NOS.	Length Over All, Inches	Size of Bed, Inches			Depth of Box, Inches	Capacity, Cubic Feet	Wheel No.	Approx. Weight, Pounds	Each
		Length	Width At Wheel	Width At Handle					
81	57	21½	15½	17½	10	2	2	26	$5.90
82	63	25	18	20	11	3	4	50	9.15
83	69	25	20	22	12	4	4	55	9.60
84	74	28	21	24	14	6	16	66	11.55
90	65	27	15¾	19¾	11½	3	2	50	7.95

NO.	Dimensions, Inches						Wheel No.	Approx. Weight, Pounds	Each
	Length of Handle	Width of Bottom Handle	Width of Dash at Bottom	Width of Dash at Top	Width of Dash at Bottom	Length of Dash			
65	55	24	21	14	17	30	16	68	$14.55

RAILROAD OR CANAL WHEELBARROWS

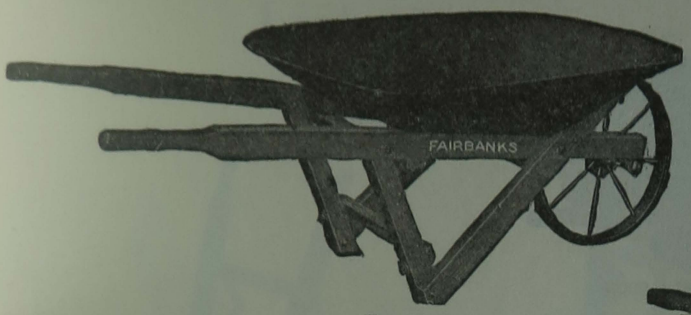


Fig. 2919

NO. 1138

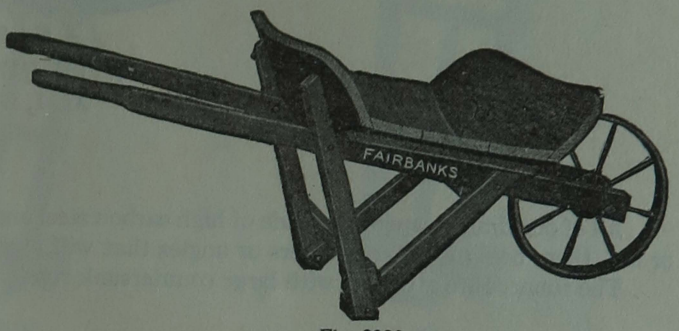


Fig. 2920

NO. 15

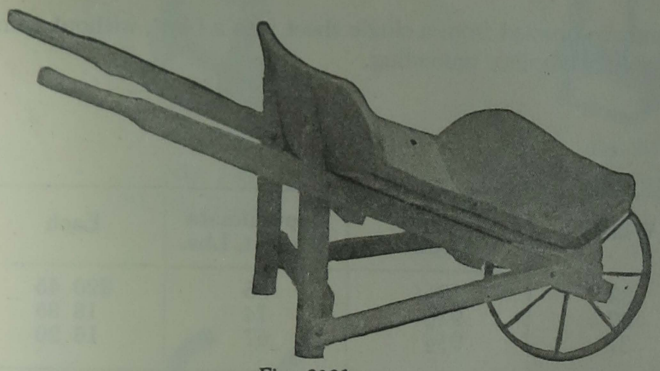


Fig. 2921

NO. 10

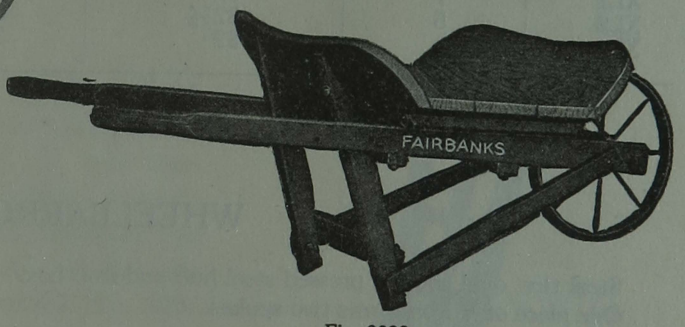


Fig. 2922

NO. 20

No. 1138 answers all the requirements of a wood-tray barrow at a small increase in cost and will outlast the all-wood type.

No. 10 is intended for a canal, railroad or contractors' barrow. Tray is nailed to frame.

No. 15 is intended for the same purposes as the No. 10, but is a full bolted barrow. The standard all-wood barrow.

No. 20 made wholly of hardwood, constructed to meet the severe requirements of railroads and contractors.

NOS.	Size of Tray, Inches		Capacity, Cubic Feet	Wheel No.	Approx. Weight, Pounds	Each
	Length On Top	Width On Top				
10	29	32½	3	2	44	$6.10
15	29	32½	3	4	45	6.30
20	29	32½	3	4	61	7.95

NO.	Size of Tray, Inches				Capacity, Cubic Feet	Tray Gauge No.	Wheel No.	Approx. Weight, Pounds	List Price, Each
	Length On Top	Width On Top	Depth At Wheel	Depth At Handles					
1138	33	28	7	4½	3	18	4	40	$8.80

FAIRBANKS DRAG SCRAPERS

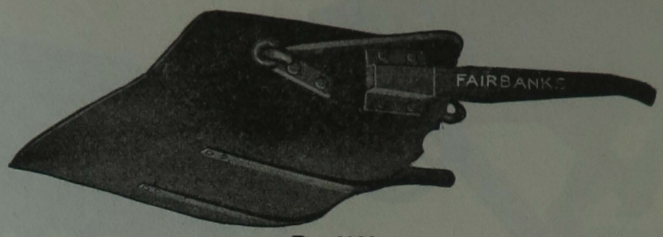


Fig. 2923

WITH RUNNERS
XL-1, 2 and 3

All of our drag scrapers are made of high carbon steel and are pressed from a single sheet into a bowl, without seam or lap, there being no sharp corners or angles that will prevent complete unloading.

The runners are attached with large countersunk rivets.

Size NO.	Capacity, Cubic Feet	Top of Back to Cutting Edge	Width	Greatest Depth	Approximate Weight, Lbs.	Each
XL1	7	33	33	10¼	85	$20.45
XL2	5	32½	30	9½	74	18.85
XL3	3	32	27	9½	67	16.20

WHEELBARROW WHEELS

Steel tire, oval spokes, pressed steel hub and iron box.
One piece of V iron forms two spokes.

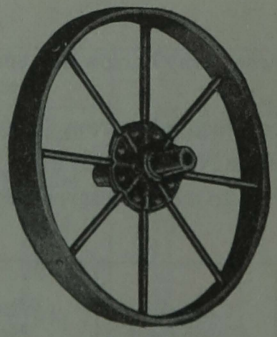


Fig. 2924

Wheel NO.	Diameter, Inches	Size of Tire, Inches	Size of Spokes, Inches	Length Hub and Diameter Axle, Inches	Approx. Weight, Pounds	Each
2	16	1¼x¼	½ Oval	6¾—½	8½	$1.80
4	16	1½x¼	½ Oval	6¾—½	8¾	1.90
5	16	1½x¼	½ Oval	6¾—⅝	8¾	1.90
8	16	1⅜x⅜	⅝ Oval	6¾—⅝	12½	2.60
10	16	1½x⅜	⅝ Oval	6¾—⅝	13	2.75
12	16	1¾x⅜	⅝ Oval	6¾—⅝	14	3.20
16	19	1¾x⅜	⅝ Oval	6¾—⅝	16	3.50
22	15½	1⅞ Mall.	Ex. Heavy	6¾—⅝	18	5.40

Light Warehouse and Bag Trucks

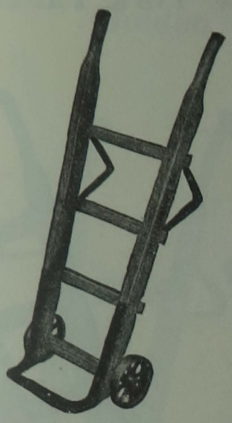


Fig. 2925

NO. 199
"Little Helper"

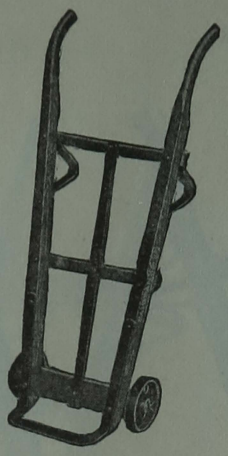


Fig. 2926

NO. 214

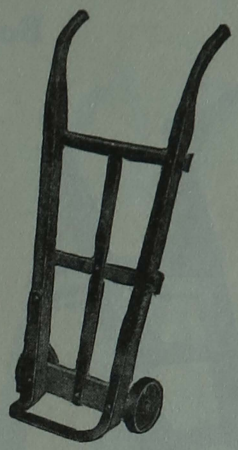


Fig. 2927

NO. 215
"Daisy"

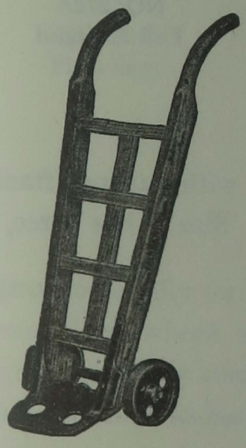


Fig. 2928

NO. 216
Cast Iron Nose

Designed for handling light cases and bags of small dimensions. Light but well constructed in every respect. They are not intended for heavy use. All handles are steam bent except No. 199. Nos. 216 and 218 are especially adapted for handling bags.

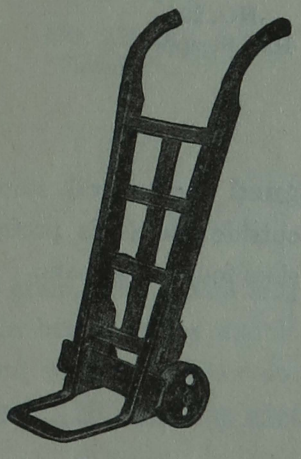


Fig. 2929

NO. 218
Wrought Iron Nose
"Minneapolis"

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
199	44	16	12½	3¾	6x1¼	⅝ rd.	22	$4.50
214	46	17½	12	4½	6x1½	¾ sq.	31	7.50
215	46	17½	12	4½	6x1½	¾ sq.	28	7.00
216	42	17	11¼	4½	6x1½	⅞ sq.	29	6.60
218	42	17	11¼	9	6x1½	⅞ sq.	32	8.35

Warehouse Trucks

Boston Pattern

New York Pattern

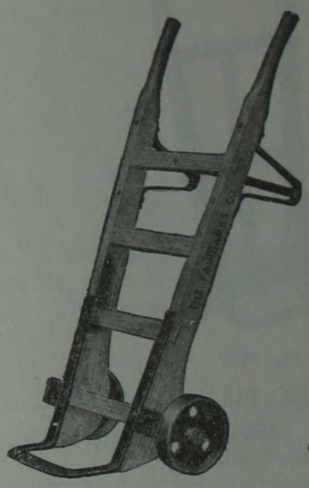


Fig. 2930

NO. 204
Half Strapped

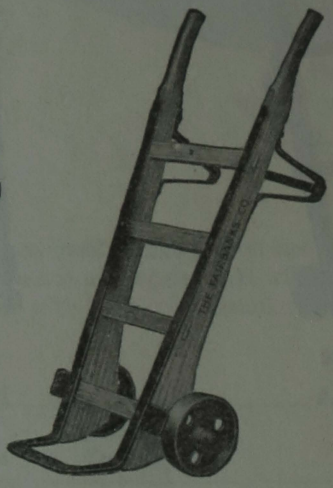


Fig. 2931

NO. 205
Full Strapped

Fig. 2932

NO. 272
Half Strapped

Fig. 2933

NO. 272A
Full Strapped

Designed for general store, warehouse and other uses where a truck with tapered frame and outside wheels is preferred. Nos. 204 and 205 have braced legs. Size 1 has three, other sizes four, cross bars.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
204–1	48	18	13	5½	6 x2	⅞ sq.	41	$10.05
2	51	19½	14	6½	8 x2½	⅞ sq.	60	12.50
3	54	21	15	7¼	8½x2½	1 sq.	76	14.30
4	60	22¾	16	7¼	10 x2½	1 sq.	94	17.85
205–1	48	18	13	5½	6 x2	⅞ sq.	42	10.65
2	51	19½	14	6½	8 x2½	⅞ sq.	61	13.15
3	54	21	15	7¼	8½x2½	1 sq.	77	15.50
4	60	22¾	16	7¼	10 x2½	1 sq.	95	18.95
272–1	48	18	13	5½	6 x2	⅞ sq.	40	9.20
2	51	19½	14	6½	8 x2½	⅞ sq.	58	11.40
3	54	21	15	7¼	8½x2½	1 sq.	72	13.50
4	60	22¾	16	7¼	10 x2½	1 sq.	91	16.60
272A–1	48	18	13	5½	6 x2	⅞ sq.	40	9.95
2	51	19½	14	6½	8 x2½	⅞ sq.	60	12.35
3	54	21	15	7¼	8½x2½	1 sq.	75	14.65
4	60	22¾	16	7¼	10 x2½	1 sq.	96	17.60

Grain Trucks

Golden Gate Pattern

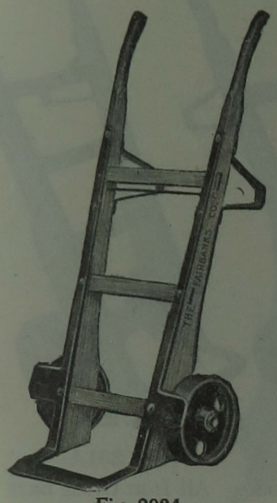


Fig. 2934

NO. 219
Plain Legs

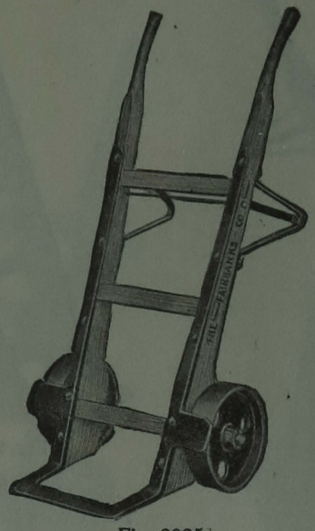


Fig. 2935

NO. 220
Reinforced Legs

Feed Truck

Fig. 2936

NO. A1310
"Favorite"

Designed especially for handling hay and feed in the bale and bags of grain, etc. Extra long nose irons; large wheels which make easy trucking. No. A1310 has steam bent handles and is of a light but strong construction. The wheel guards and nose iron are welded together on Nos. 219 and 220, forming one piece. The frames are reinforced by a tie rod. No. 220 has reinforced legs.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
219	56	19	15	7	10x2½	1⅛ sq.	83	$19.70
220	59	20¼	16	9½	12x3	1¼ sq.	115	24.90
A1310	58	20½	16½	8¼	10x2½	1⅛ sq.	81	15.10

Barrel Trucks

Boston Pattern

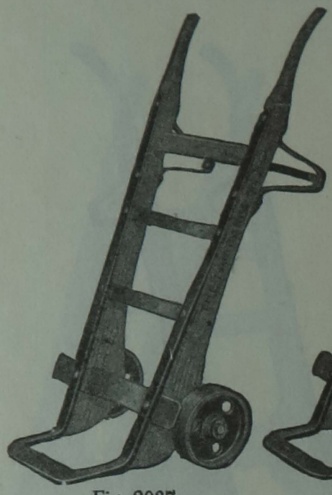


Fig. 2937

NO. 300
Top Cross Bar Wood

Fig. 2938

NO. 300A
All Iron Cross Bars

New York Pattern

Fig. 2939

NO. 301
Top Cross Bar Wood

Fig. 2940

NO. 301A
All Iron Cross Bars

Designed for general store, warehouse and other uses where barrels are to be handled but are not intended for general freight house or stevedore uses. Nos. 300 and 300A have braced legs. Nos. 300 and 301 have a top cross bar of wood. Size 1 has three, other sizes four, curve irons.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
300–1	48	18	13	5½	6 x2	⅞ sq.	45	$10.95
2	51	19½	14	6½	8 x2½	⅞ sq.	66	14.15
3	54	21	15	7¼	8½x2½	1 sq.	82	16.50
4	60	22¾	16	7¼	10 x2½	1 sq.	107	20.20
300A-1	48	18	13	5½	6 x2	⅞ sq.	45	11.70
2	51	19½	14	6½	8 x2½	⅞ sq.	66	14.65
3	54	21	15	7¼	8½x2½	1 sq.	82	17.15
4	60	22¾	16	7¼	10 x2½	1 sq.	107	20.85
301–1	48	18	13	5½	6 x2	⅞ sq.	44	10.30
2	51	19½	14	6½	8 x2½	⅞ sq.	65	13.00
3	54	21	15	7¼	8½x2½	1 sq.	78	15.65
4	60	22¾	16	7¼	10 x2½	1 sq.	98	18.95
301A-1	48	18	13	5½	6 x2	⅞ sq.	44	11.05
2	51	19½	14	6½	8 x2½	⅞ sq.	65	13.80
3	54	21	15	7¼	8½x2½	1 sq.	78	16.50
4	60	22¾	16	7¼	10 x2½	1 sq.	98	19.80

Cotton Trucks

New Orleans Pattern

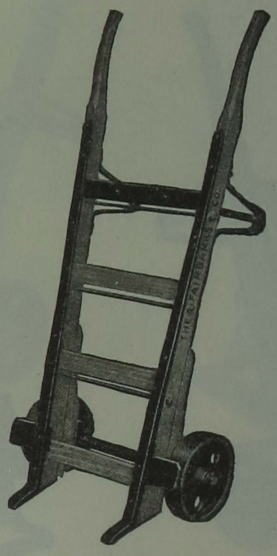


Fig. 2941

NO. 2134½
Style "A" Wheel Guards

Fig. 2942

NO. 213-5
Style "B" Wheel Guards

Designed for handling cotton in the bale. Strongly constructed of selected stock. Reinforced legs. Tie rods at each cross bar prevent spreading and make truck more rigid. Large wheels. Heavy axle which is held in place by cast-iron axle boxes. Nos. 213-5 has an extra brace on top of the axle, giving more strength. It also has lower cross bar and wheel guards in combination. Heavy wheel guards.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
213-4½	60	21½	17	3½	10x2½	1⅛ sq.	95	$17.90
213-5	64	22	17	3½	12x3	1⅛ sq.	120	23.00

Dry Goods Truck

Stevedore, Freight or Cargo Truck

Sugar or Grain Truck

Chicago Pattern

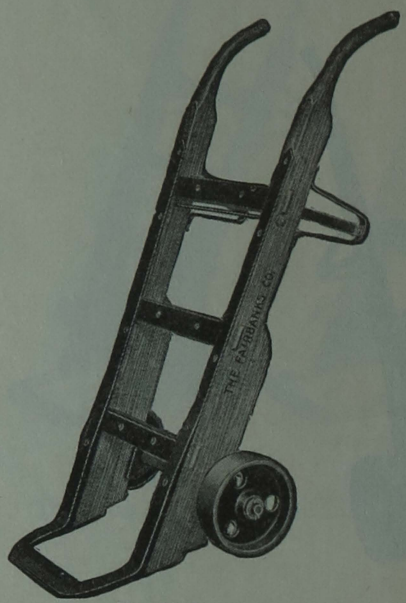


Fig. 2943

NO. A1304

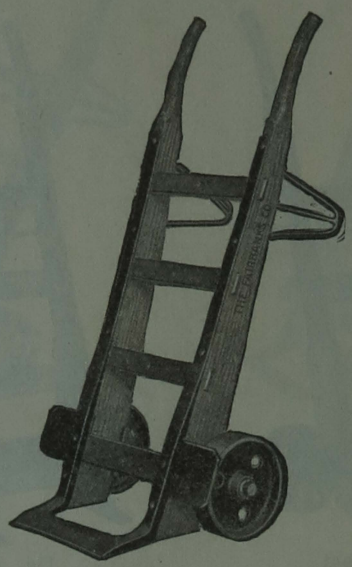


Fig. 2944

NO. 342

Fig. 2945

NO. A2410

Number A1304 is designed for handling dry goods cases. Constructed on long, sloping lines to admit of breaking load easily, and on that account *this truck will not stand alone.* Handles steam bent and carefully selected.

Number 342 is designed on plain, rugged lines for railway and steamship use. Handles, which are extra heavy, are cut from a single piece of selected hardwood. Lower cross bar and wheel guards are welded together to insure greatest possible strength. Reinforced round iron legs. Extra heavy nose.

Number A2410 is designed for handling several bags of sugar, grain, etc., at a time. Equally well adapted to dock and warehouse requirements. Extra long handles, which are cut from carefully selected hardwood. Extra wide, heavy wheel guards. Legs reinforced, heavy axle, well braced.

The axles on all three of the above-mentioned trucks are held in place by cast-iron axle boxes.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
342	61	21	18	5½	11x3	1½ sq.	152	$34.50
A1304	52	19¼	15⅛	6⅜	8x2½	1 sq.	70	15.00
A2410	71	23½	18¼	7½	14x3	1½ sq.	198	42.80

Stevedore, Freight or Cargo Trucks

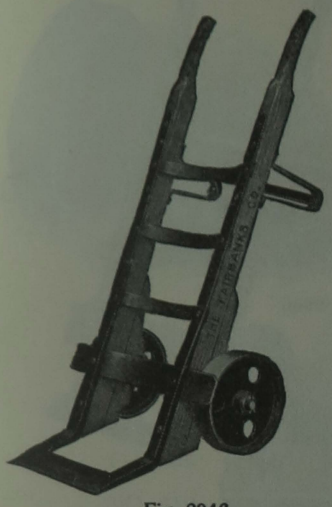


Fig. 2946

NO. 278

Fig. 2947

NO. 221

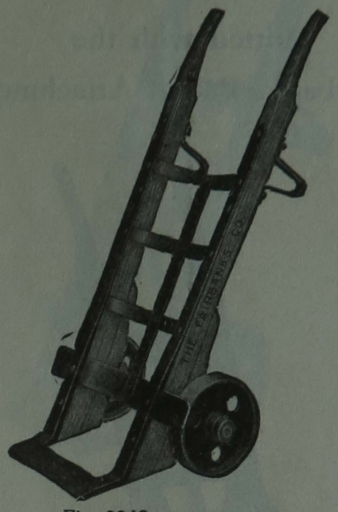


Fig. 2948

NO. A4169

These Trucks are especially designed for railroad, dock and steamship use. They are unsurpassed for this class of work where a heavy, thoroughly reliable truck is required. Adopted as standard by many of the leading transportation companies. Constructed on plain, substantial lines to withstand the constant hard, rough usage that work of this kind entails. Handles are of hardwood. All iron parts are extra heavy and well bolted and riveted together. The lower cross bar is extra wide and extends at either side of the truck to form the wheel guards. Large diameter wheels. Heavy axles held in place by cast-iron axle boxes.

Number 278 has an extra long nose iron and braced legs.

Number 221 is similar to No. A4169 but of lighter construction and without the center strap.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
221	60	20¼	17¼	7	9½x3	1¼ sq.	143	$27.80
278	60	20¼	17¼	9	12 x3	1¼ sq.	148	29.65
A4169	60	20¼	17¼	7	11½x2½	1⅜ sq.	160	29.80

Stevedore, Freight or Cargo Truck

Fitted with the
Fairbanks Patent Attachment

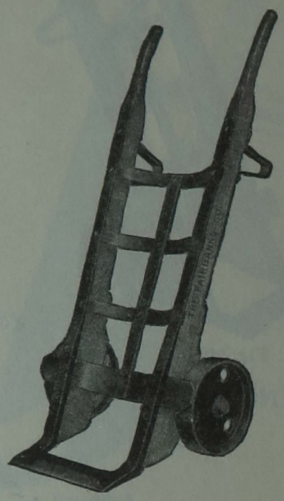


Fig. 2949

NO. A4170

Fairbanks Patent Attachment

Fig. 2950

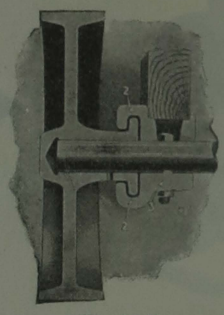


Fig. 2951

This Truck is the same in every respect as No. A4169, page 641, except that it is fitted with the FAIRBANKS PATENT ATTACHMENT.

We recommend this truck for the same purposes as No. A4169, with the feeling that it will do all that is claimed for it—and a little more.

All bolts are equipped with Patent Lock Washers, which prevent the nuts from becoming loose.

The FAIRBANKS PATENT ATTACHMENT can be fitted to any two-wheel truck, the wheels of which are on the outside of the frame. The illustrations show the construction. The wheel is cast with a flange on it. This flange engaging in the grooves (2) in the metal bolster and cap (the axle being held in place by means of the metal cap (3), supported by two bolts), prevents the wheel from coming off *until taken off*. The construction is exceedingly simple and effective. The axle is of cold rolled steel, practically wear-proof and indestructible, having no bolt holes to weaken. Bolts are furnished with Patent Lock Washers. Prices on application.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
A4170	60	20¼	17¼	6½	11½x2½	1¼ rd.	154	$30.90

Stevedore, Freight or Cargo Trucks

Fig. 2952

NO. 319

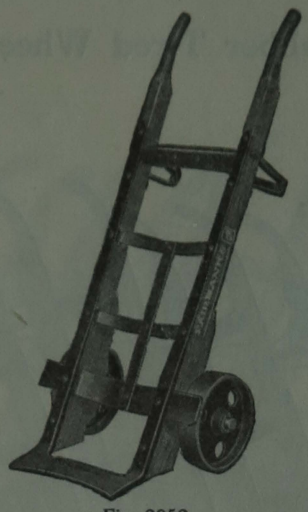


Fig. 2953

NO. A4420

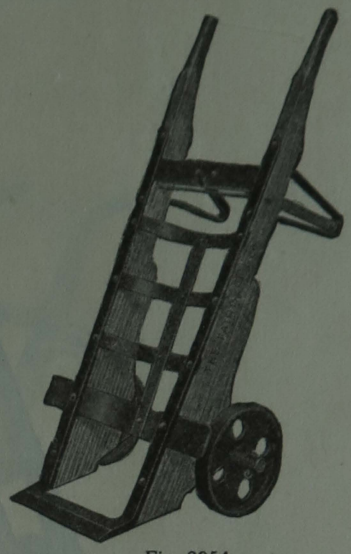


Fig. 2954

NO. A4440

Number 319 is designed to handle heavy freight, cases or barrels, but is a lighter pattern than trucks on page 642, having only three curve irons. The wheel guard (5 x ¼ inches) and curved iron cross bar are combined. Large wheels. Heavy axle. Reinforced legs.

Number A4420 is designed for general stevedore use and to carry rolls of paper. The top bar is of wood, iron strap with tie rod running across just above. The roll of paper which rests on top of bar gives ample room for truckman's hands. Nose iron, concave. Handles, selected hardwood. Center strap riveted to wheel guard and curved irons. Large, broadfaced wheels. Heavy axle held in place by cast-iron axle boxes. Reinforced legs.

Number A4440 is one of the heaviest trucks made and is designed especially to meet the trying requirements of the railroad and steamship companies who want an unusually rugged truck. All parts are of extra weight and strength. Handles are of hardwood, 72 inches long, and are reinforced with heavy wooden bolsters. Wheel guards and lower cross bar made of one piece. Large diameter wheels. Axle extra heavy and held in place by cast-iron axle boxes reinforced with an axle brace.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
319	57	20½	16	5¼	10x2½	1¼ sq.	120	$21.60
A4420	65	21	17½	7¼	12 x3	1½ sq.	150	30.80
A4440	72	23⅝	18	5	13½x2	1¾ sq.	202	47.40

Hotel or Carpet Trucks

Rubber Tired Wheels

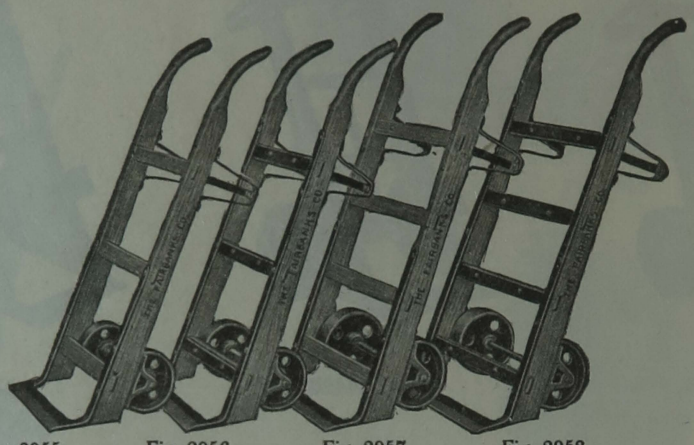


Fig. 2955 — NO. 209-1 Half Strapped

Fig. 2956 — NO. 209B-1 Full Ironed

Fig. 2957 — NO. 209-2 Half Strapped

Fig. 2958 — NO. 209B-2 Full Ironed

The most popular hotel truck on the market. Constructed of the best materials, and combines strength with light weight. Steam-bent handles, which enable the truckman to handle it with ease, even when the article on the truck extends up and beyond the handle grip. *Rubber-tired wheels*, placed on the inside of the handles, which prevent the damaging of doorways, etc. This type is the same as Figures 200 and 201, page 646, which are equipped with plain iron wheels. Can be furnished with Divine Cushion Wheels, page 676, upon request. Size 1 has three, other sizes four, cross bars.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
209–1	48	19	19	4¾	7x1¼	⅞ rd.	42	$16.85
209–2	50	21	21	4¾	8x1⅜	⅞ rd.	66	19.35
209B–1	48	19	19	4¾	7x1¼	⅞ rd.	55	17.85
209B–2	50	21	21	4¾	8x1⅜	⅞ rd.	68	20.80

Western Pattern Trucks

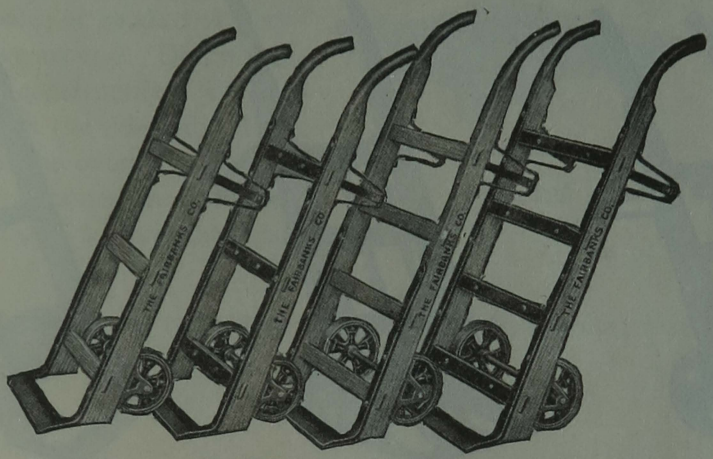


Fig. 2959 NO. 200-1 Half Strapped

Fig. 2960 NO. 201-1 Full Ironed

Fig. 2961 NO. 200-2 Half Strapped

Fig. 2962 NO. 201-2 Full Ironed

A Western design of truck for use in produce and packing houses, warehouses, stores, etc. The wheels, being placed on the inside of the handles, admit of the truck being used in very close quarters, as in narrow passageways. The widest dimensions of the truck is the width over the handles, which are steam bent and enable the truckman to operate even when the article extends beyond the length of the handle. Size 1 has three, other sizes four, cross bars.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
200–1	48	19	19	4¾	7 x2	⅞ rd.	42	$12.45
2	50	21	21	4¾	8 x2½	⅞ rd.	66	14.05
3	54	22	22	5¼	8½x2½	1 rd.	72	16.35
201–1	48	19	19	4¾	7 x2	⅞ rd.	55	13.45
2	50	21	21	4¾	8 x2½	⅞ rd.	68	15.45
3	54	22	22	5¼	8½x2½	1 rd.	89	18.40

Western Pattern Trucks

Warehouse Trucks

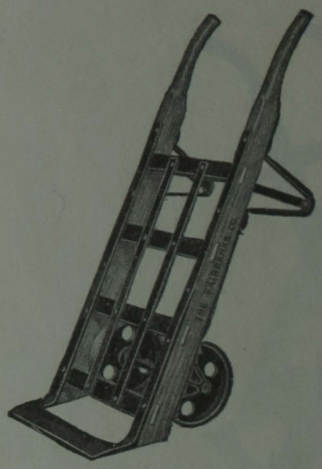


Fig. 2963

NO. 202-4

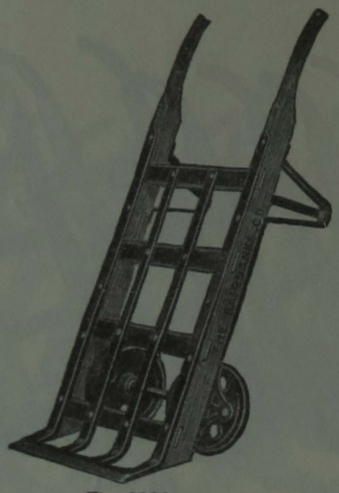


Fig. 2964

NO. 203-4XX

Barrel Truck

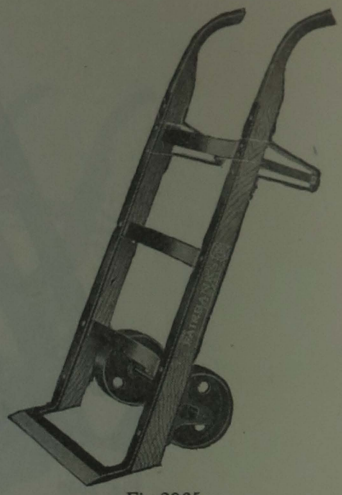


Fig.2965

NO. 207 A

All Iron Cross Bars

Numbers 202-4 and **203-4XX** are designed for the use of railroads, produce and packing houses and many other industries. Construction of the two trucks is the same except that the center straps on No. 203 extend down and are welded to the nose iron, making a very rigid construction. Well balanced and easy to operate under any conditions. We unhesitatingly recommend this truck to do all that is claimed for it. All wood parts are of hardwood and heavily ironed. Large diameter wheels.

Number 207 A is designed for handling either barrels or cases where a truck with wheels on the inside of the frame is required. The construction is the same as No. 201, page 646, the only difference being in the cross bars, which are made of curved steel to conform to a barrel. Number 1 has three, other sizes four, curve irons.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length of Handles	Width at Top Bar	Width at Nose	Length of Nose	Wheels	Axle		
202–4	60	23	23	6½	11 x2½	1⅛ rd.	134	$24.20
203–4XX	60	23	23	6½	11 x2½	1⅛ rd.	145	27.95
207A-1	48	19	19	4¾	7 x2	⅞ rd.	55	14.65
2	50	21	21	4¾	8 x2½	⅞ rd.	68	16.65
3	54	22	22	5¼	8½x2½	1 rd.	89	19.50

Box or Case Trucks

Number 223 is designed for handling heavy, bulky cases and bales of goods. A very handy truck to have around. Of low and exceedingly strong construction. Wheels are set in routings in the side rails. This materially reduces the overall height of the truck. Tops of frames are equipped with spur head bolts to prevent load from slipping.

Fig. 2966

NO. 223
Four Wheels

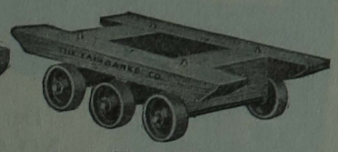


Fig. 2967

NO. 224
Six Wheels

Number 224 is constructed so as to balance on center wheels, enabling ease in turning. Wheels are set flush with sides of truck.

All-Malleable Iron Case Trucks

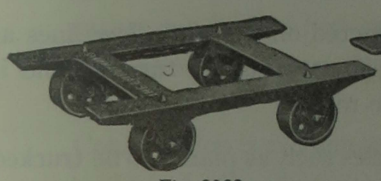


Fig. 2968

NO. L1191

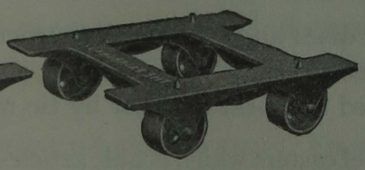


Fig. 2969

NO. L1192

Numbers L1191 and **L1192** are constructed entirely of malleable iron and are unequaled for strength and durability, combined with lightness in weight, and are practically indestructible.

Number L1191 has a capacity of one ton.

Number L1192, 1½ tons.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length	Width	Height	Rails	Wheels	Axles		
223–1	18	18	5	3½x2¾	3⅞x1⅜	¾ sq.	30	$8.20
2	26	18	5	3½x2¾	3⅞x1⅜	¾ sq.	35	8.65
224–3	24	16	6½	4 x1¾	3⅞x1⅜	¾ sq.	35	9.05
4	36	22	6½	4 x1¾	3⅞x1⅜	¾ sq.	45	10.45
L1191	21¾	15¼	5	.....	4 x1½	½ rd.	26	10.75
L1192	22¼	15¾	5	.....	4⅜x2¼	½ rd.	35	13.75

Timber Dollies

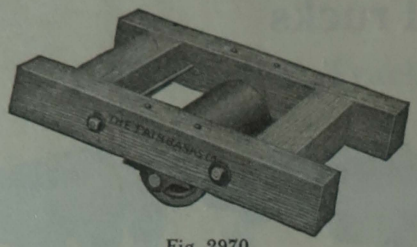


Fig. 2970

NO. 282-1

Squared Ends

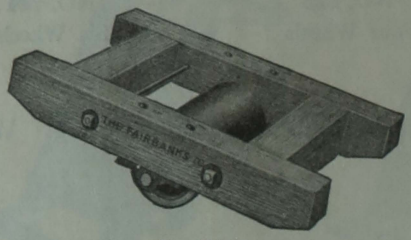


Fig. 2972

NO. 282-2

Beveled Ends

Box or Case Trucks

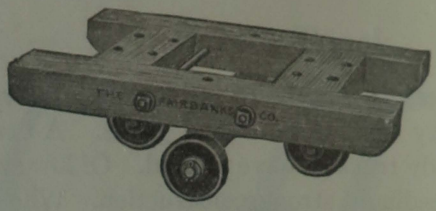


Fig. 2971

NO. 293

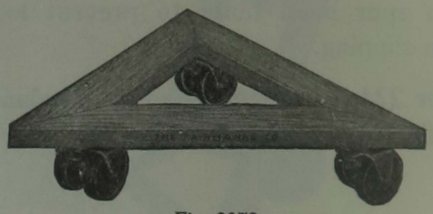


Fig. 2973

NO. K 1122

Numbers 282-1 and **282-2.** Designed for handling heavy timber. Can be used as a truck or, inverted, as a roller. Very strong frame construction, well mortised together and held by two tie rods. Heavy cast-iron roller and axle boxes. Can also be furnished with hardwood roller when desired.

Number 293 is designed for carrying bulky cases and boxes. Constructed on the same low lines as Figures 223 and 224, page 18. Balances on center wheels, which insures ease in turning, and is without spur head bolts. Frame mortised and held together by tie rods.

Number K1122 is furnished with three swivel casters which enable articles such as pianos to be trucked into any space desired.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Length	Width	Height	Rails	Roller		
282–1	18¾	15¾	7¾	2½x3¾	10x6	50	$ 9.80
2	26	19¼	7¾	3¼x3¾	12x6	70	11.50

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length	Width	Height	Rails	Wheels	Axles		
293	24	18	7¼	4 x2½	3⅞x1⅜	¾ sq.	40	$9.60
K1122	24	24	5	3½x ⅞	3⅛x ¾	.....	13	6.85

Box or Case Truck

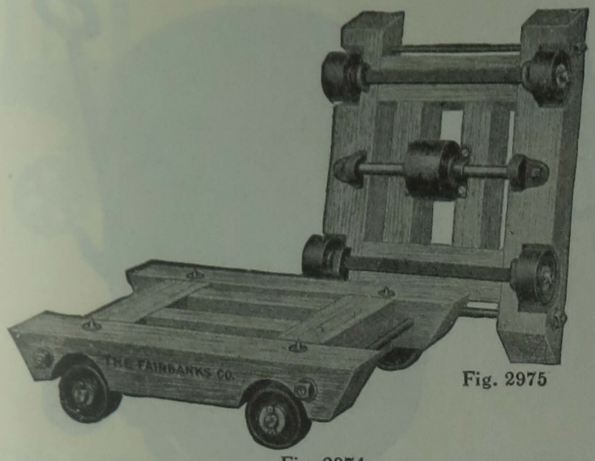


Fig. 2975

Fig. 2974

NO. V1110

Piano or Machinery Truck

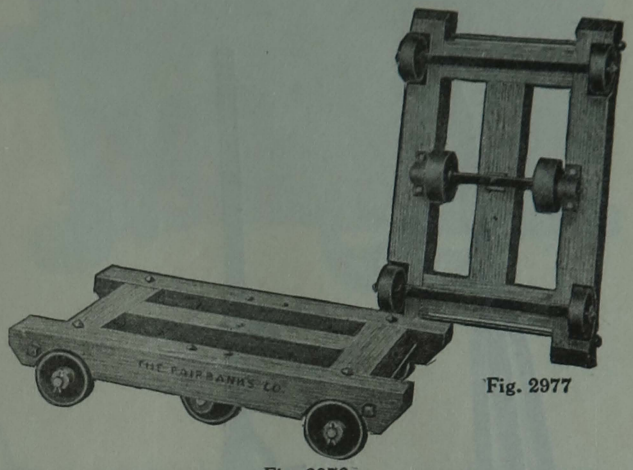


Fig. 2977

Fig. 2976

NO. Y1112

Designed for handling heavy machinery, engines, pumps, pianos, etc. Anything of a heavy, bulky nature can be handled on these trucks with the greatest facility. Intended for heavier work than the ordinary case trucks such as Numbers 223 and 224, page 648.

Construction is extremely strong and compact. Framing is securely mortised together and reinforced by ½-inch tie rod at either end. Truck balances on the center wheel (V1110), or two center wheels (Y1112) which are of large diameter and broader face than the outside wheels and operate easily in any direction under load. Equipped with spur head bolts to prevent load from slipping off.

Number	Dimensions in Inches							Approximate Weight, Pounds	List Price, Each
	Length	Width	Height	Rails	Wheels		Axles		
					Corner	Center			
V1110	22½	15½	5⅜	3x3	3¼x1⅜	3¾x2⅜	⅞	32	$14.35
Y1112	36	22	7¼	4x3½	5 x1½	5½x2	1 sq.	100	20.60

Single Handle Trucks

Shoe Case Ash Can Sugar House All Iron

Fig. 2978

NO. 227
"Little Giant"

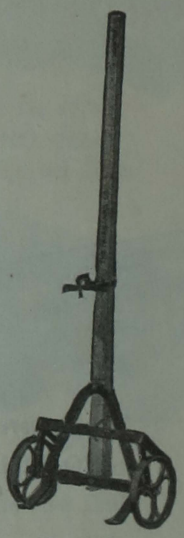


Fig. 2979

NO. C1145
The Eureka

Fig. 2980

NO. C1321

Fig. 2981

NO. C3100

Number 227 is designed for handling shoe boxes and other light packages in narrow aisles. An economical and convenient way to handle light boxes.

Number C1145 is designed for handling ash cans, kegs and other articles of light weight. The nose iron can be raised or lowered, forming either the points or a continuous bar across.

Number C1321 is especially adapted for handling barrels of sugar, oil, etc. Of light, strong construction. Note hook which slides down and catches on the chine of the barrel—load cannot roll off. The spur head bolts hold the barrel in place at the bottom.

Number C3100 is to be used where an all iron truck is desired and is especially adapted where any cask, from a keg of nails to a large size barrel, is to be handled. Handle is $\frac{7}{8}$ inch round, extending down and forms a nose iron similar to No. 272, page 637.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Length of Handle	Width at Nose	Width Over All	Wheels	Axle		
227	56	10¼	13¼	3½x ⅞	¾ sq.	10	$5.15
C1145	50	10⅝	16½	7¼x1	½ sq.	14	5.50
C1321	60	16½	23	7 x2	1¼ sq.	45	12.50
C3100	44	13½	26	7½x2	1⅛ sq.	40	17.30

Grocery Trucks

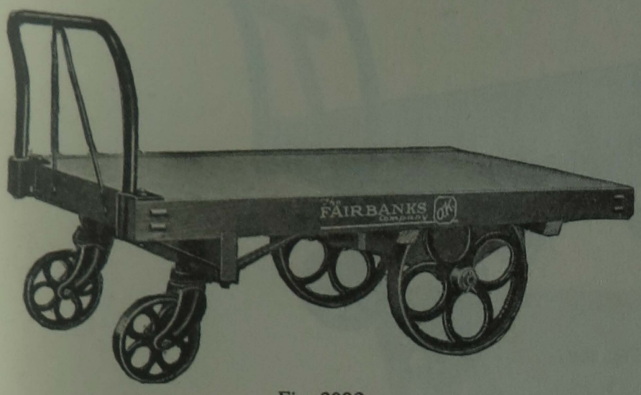


Fig. 2982
NO. Q2183

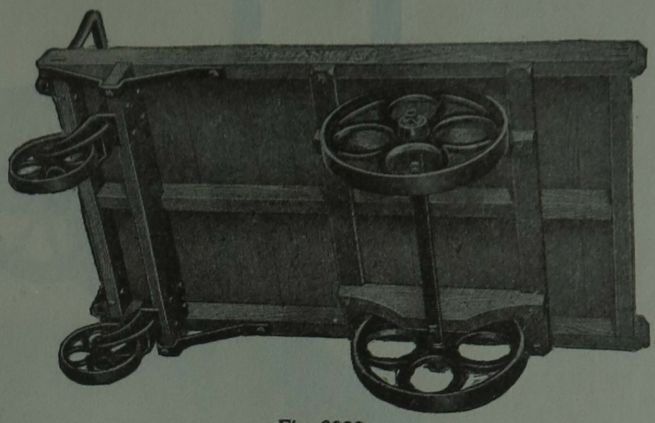


Fig. 2983
NO. Q2183

This type of truck is unsurpassed for handling all sorts of merchandise, especially in produce houses, stores and warehouses. The large wheels at the front are so arranged as to carry the greater portion of the load, thereby making the truck easier to operate. Truck turns in its own length. Platform is framed with cross sills, mortised into side rails. Bolsters and axles are well braced. The large wheels are furnished with roller bearings in the hubs. Caster wheels revolve on large sized spindles, not the small bolt so commonly used. The casters are ball bearing and turn easily under heavy loads. Removable handles and package rack. Made throughout of oak. Platform set flush with side rails.

Note illustration showing underconstruction and how sturdy and well built this truck is.

Number	Dimensions in Inches								Approximate Weight, Pounds	List Price, Each
	Length Over All	Platform			Height of Rack	Wheels		Axles		
		Length	Width	Height		Front	Caster			
Q2170 (0)	41½	36	24	14	17	12x2	6x1¼	1⅛ sq.	152	$33.45
Q2171 (1)	53½	48	24	14	17	12x2	6x1¼	1⅛ sq.	170	34.30
*Q2172 (9)	53½	48	24	19	17	18x2¼	9x1½	1¼ sq.	240	42.40
Q2173 (3)	53½	48	30	14	17	12x2	6x1¼	1⅛ sq.	182	37.00
*Q2174 (11)	53½	48	30	19	17	18x2¼	9x1½	1¼ sq.	252	45.45
Q2175 (5)	53½	48	36	14	17	12x2	6x1¼	1⅛ sq.	193	38.95
*Q2176 (15)	53½	48	36	19	17	18x2¼	9x1½	1¼ sq.	220	47.35
*Q2177 (13)	59½	54	30	19	17	18x2¼	9x1½	1¼ sq.	260	46.30
Q2178 (4)	65½	60	24	14	17	12x2	6x1¼	1⅛ sq.	176	36.35
*Q2179 (18)	65½	60	24	19	17	18x2¼	9x1½	1¼ sq.	254	44.40
Q2180 (6)	65½	60	30	14	17	12x2	6x1¼	1⅛ sq.	190	37.65
*Q2181 (16)	65½	60	30	19	17	18x2¼	9x1½	1¼ sq.	270	46.35
Q2182 (8)	65½	60	36	14	17	12x2	6x1¼	1⅛ sq.	200	40.20
*Q2183 (21)	65½	60	36	19	17	18x2¼	9x1½	1¼ sq.	285	48.65
*Q2184 (19)	77½	72	24	19	17	18x2¼	9x1½	1¼ sq.	260	46.65
*Q2185 (20)	77½	72	30	19	17	18x2¼	9x1½	1¼ sq.	280	47.95
*Q2186 (22)	77½	72	36	19	17	18x2¼	9x1½	1¼ sq.	300	49.85

*Can be furnished with 18 x 3½ inch wheels at front, and with 9 x 2½ inch caster wheels in extra heavy caster forks. Prices on application.

Freight House Truck

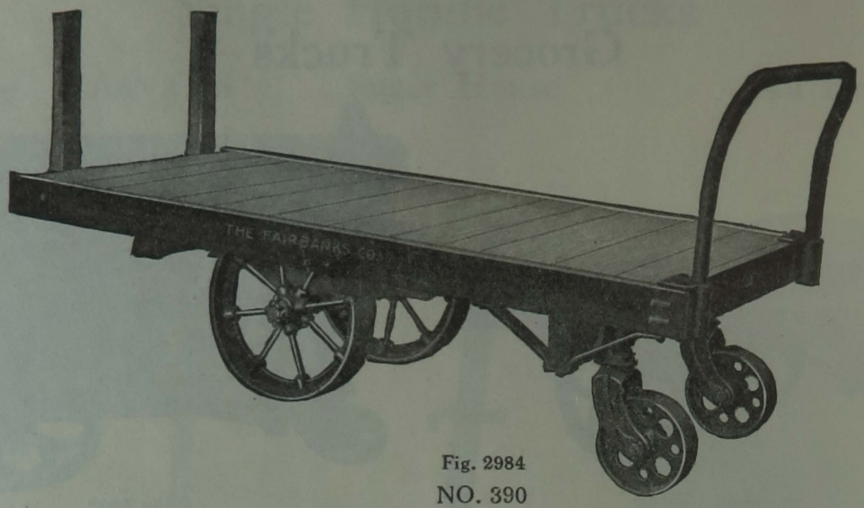


Fig. 2984
NO. 390

This truck has become standard equipment with many of the leading railroad and express companies, its rugged construction and easy running qualities appealing strongly to their traffic experts. Note that the large wheels are placed very near the center of the truck. These wheels take the major portion of the load, leaving the casters comparatively free for steering purposes. Heavy framed platform with cross sills mortised into side rails. Selected oak used throughout. Axle (1½ inches square) rests on longitudinal bolsters. Large wheels have broad face (18 x 3½ inches) and are fitted with steel roller bearings. Casters are fitted with 8½ x 2½-inch wheels and turn on 1-inch *Cold-rolled Steel Axle* and not the small bolt so commonly used. The casters are ball bearing and turn easily under heavy loads. Casters are bolted to heavy wood bolster, which is strongly reinforced by four iron braces. To permit the handling of small packages we can furnish removable wood end racks at slight additional cost.

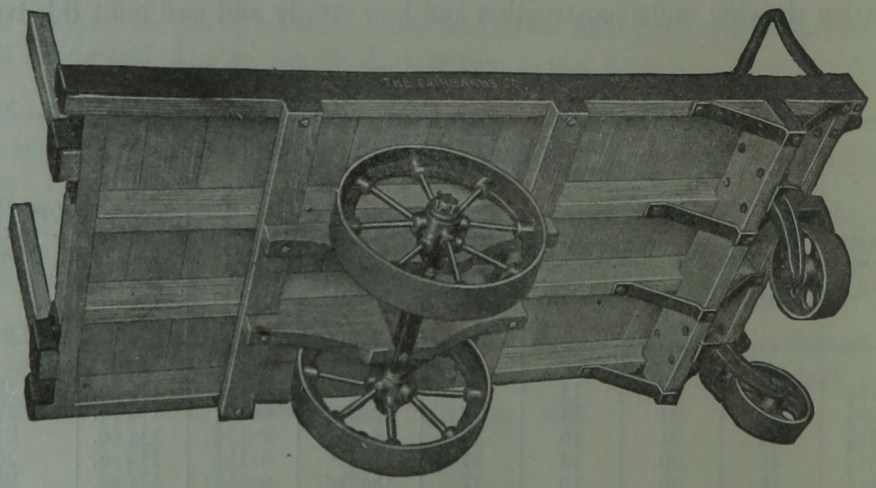


Fig. 2985
NO. 390

The illustration showing the underside of the truck will give you an idea of how well constructed the truck is.

Number	Dimensions in Inches									Approximate Weight, Pounds	List Price, Each
	Length Over All	Platform			Height of Handle	Height of Stakes	Wheels		Axle		
		Length	Width	Height			Front	Caster			
390	76	72	36	20	18	25	18x3½	8½x2½	1½	375	$76.70

Platform or Wagon Trucks

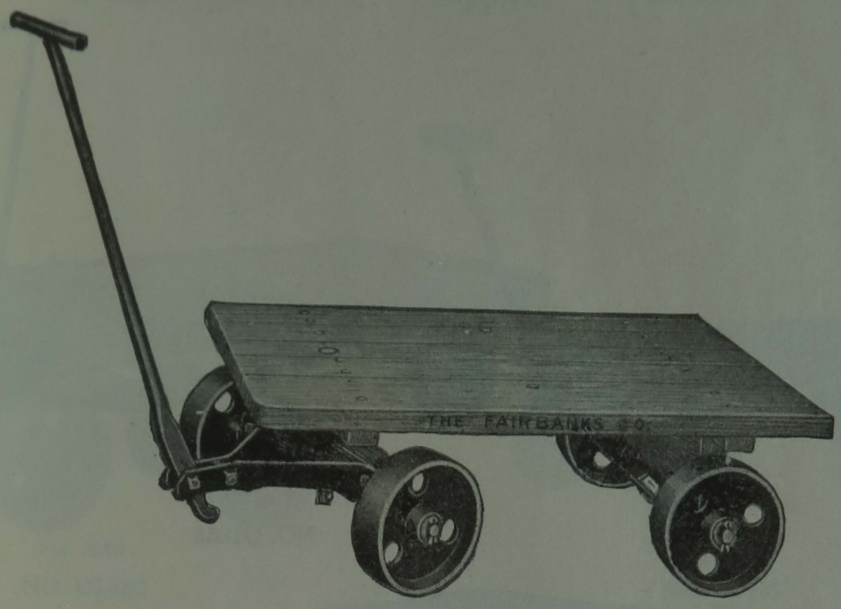


Fig. 2986

NO. O1302

Designed for all-around warehouse and factory use. The places in which this truck can be used are too numerous to mention. Constructed on plain, substantial lines. Platform and bolsters are of straight-grain hardwood. Handle is ⅞-inch round steel. Wheels, style "E" or solid webb pattern, give the maximum of strength. Can be furnished with rubber-tired wheels or Divine Cushion Wheels. All parts are well proportioned. Other styles of handles can be furnished at slight additional cost. For larger sizes, see page 655.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Platform			Wheels	Axles		
	Length	Width	Height				
O1302	30	18	8	5x2	⅞ sq.	70	$20.20
O1325 (No. 1)	36	24	12	8x2½	1 sq.	110	25.90
O1327 (No. 2)	38	26	12	8x2½	1 sq.	120	26.95
O1331 (No. 3)	40	28	12	8x2½	1 sq.	125	27.55
O1334 (No. 4)	42	30	13	9x2½	1⅛ sq.	155	31.20
O1336 (No. 5)	44	32	13	9x2½	1⅛ sq.	165	32.45
O1338 (No. 6)	46	34	13	9x2½	1⅛ sq.	180	33.90
O1347	54	30	13	9x2½	1⅛ sq.	185	36.35

Platform or Wagon Trucks

Fig. 2987

NO. O1855

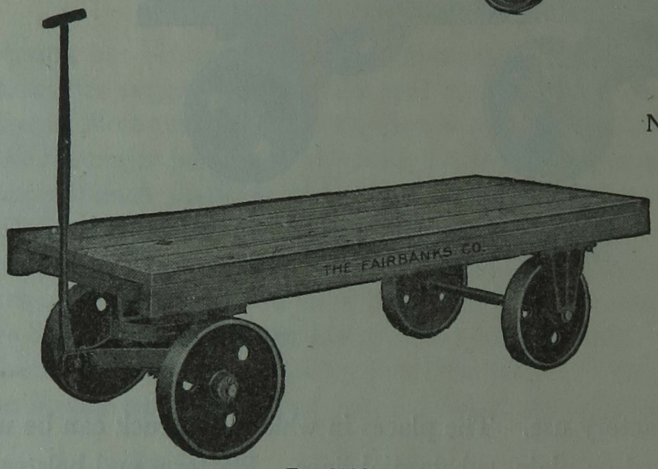


Fig. 2988

NO. O1870

Designed for general warehouse, freight house and similar uses. Platforms are wood framed, the top boards resting on cross sills which are mortised into the side rails. Made of hardwood throughout. Rear axle is round, front axle square. Large diameter fifth-wheel. Handles of 1-inch round steel. Other styles of handles furnished at slight advance in price.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Platform			Wheels	Axles		
	Length	Width	Height				
O1855 (250-1)	60	36	15½	11x2½	1¼	260	$55.10
O1856 (250-2)	60	36	19¼	14x2½	1¼	320	60.90
O1870 (251)	78	30	20½	14x2½	1⅜	360	65.85

Platform or Wagon Trucks

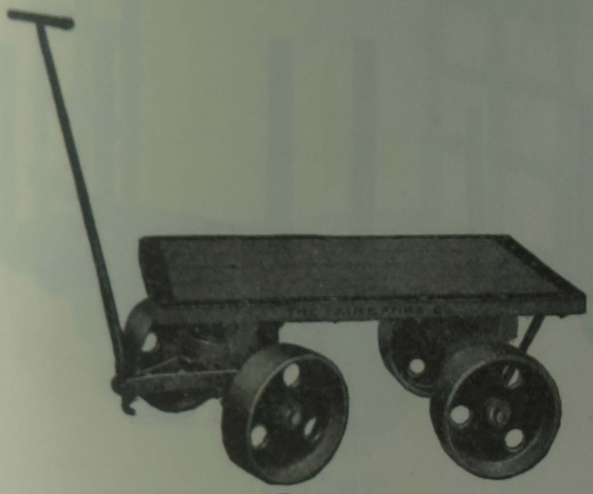


Fig. 2989
NO. O1432

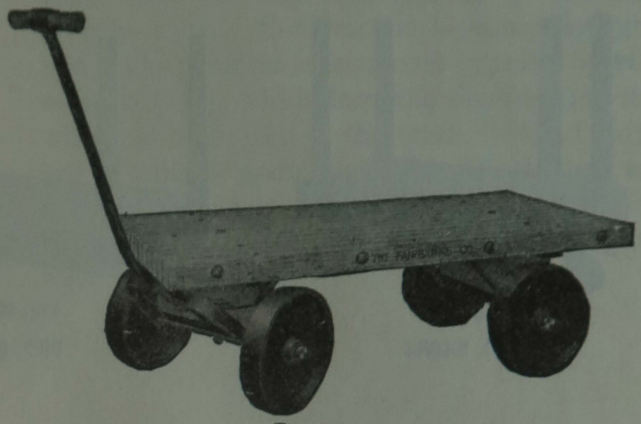


Fig. 2990
NO. O1459

Designed for handling sheet plates in the mills; well known as a Tin Plate truck. Especially adapted for railway shops, machine shops and foundry use. Constructed to stand very heavy loads and hard service. Platform of selected stock, hardwood throughout, bound around top edges (Numbers O1432 and O1433) with heavy iron straps. Large diameter wheels with broad face. Heavy axles.

Number O1459 has a capacity of four tons. The platform, which rests on two 3 x 1 inch solid iron cross sills, is made up of a number of hardwood strips, laid side by side and securely bolted together crosswise with four $\frac{5}{8}$-inch tie-rods. Handle is of 1-inch round steel. Wheels are broad faced. Axles extra heavy and well braced to platform. Large diameter fifth-wheel.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Platform			Wheels	Axles		
	Length	Width	Height				
O1432 (242)	42	20	14	9½x4	1⅜ sq.	195	$45.45
O1433	42	24	17½	12 x4	1⅝ sq.	265	51.55
O1459 (305)	72	36	21	16 x3	1¾ sq.	700	122.95

Factory Trucks

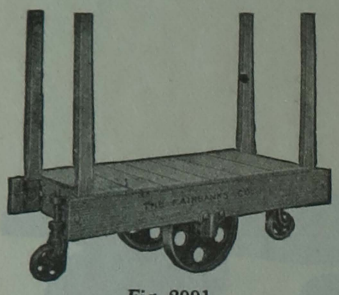


Fig. 2991
NO. S4683

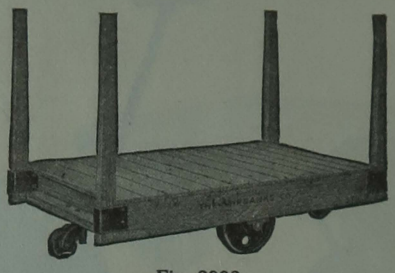


Fig. 2992
NO. 304

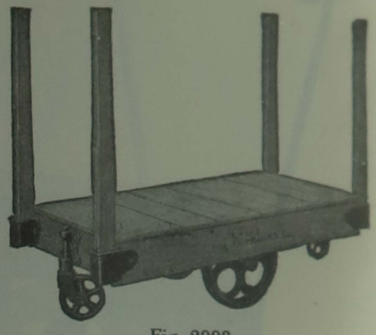


Fig. 2993
NO. S4680

Designed for general factory and mill use. Much used in furniture factories and other similar lines of industry. For carrying parts from one machine to another in the course of manufacture. Used also as Stock trucks, resulting in great economy in time, space and labor. Platform is supported by three bolsters or side rails running lengthwise of truck, making a very strong construction. Stakes are removable and interchangeable. Numbers S4680 and 304–1 and 304–2 are the "low," and Numbers S4683 and S4686 are the "high" types. Made throughout of hardwood. Large center wheels and swivel casters at ends enable truck to turn in its own length.

Number	Dimensions in Inches								Approximate Weight, Pounds	List Price, Each
	Length Over All	Platform			Height of Stakes	Wheels		Axle		
		Length	Width	Height		Center	Caster			
S4680	54	48	24	14	30	13 x2	6 x1⅛	1 rd.	140	$22.35
S4683	58	48	24	17½	30	15½x2½	6 x1⅜	1 rd.	186	30.35
S4686	58	48	30	17½	30	15½x2½	6 x1⅜	1 rd.	200	31.05
304–1	53½	48	24	13¾	30	12 x2	4¾x1¼	1⅛ rd.	170	28.55
2	65½	60	36	13¾	30	12 x2	4¾x1¼	1⅛ rd.	210	32.40

Dry Goods or Grocery Trucks

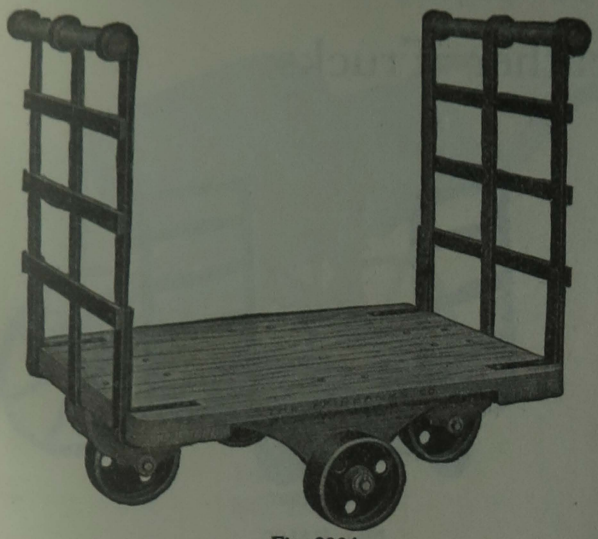


Fig. 2994
NO. R4156

Number R4156 is designed for handling heavy loads of piece goods, clothing, etc. Used also (sometimes with one rack removed) as a wholesale grocery truck. Construction is heavy throughout. The platform is reinforced laterally by two wood bolsters, which form the housings for the wheels at either end of the truck. Wood parts are of straight grain hardwood. Racks are reinforced with angles, set flush into top of platform and securely bolted into place. Iron uprights have wood top bar.

Dry Goods or Post Office Trucks

Number R4335 is especially adapted for use in dry goods establishments, where it is popular for handling piece goods, shirt boxes, etc. Used also by the U. S. Post Office Department for carrying mail bags. A first-class truck in every respect, and one that can be used to advantage in many different ways. Platform is extra heavy, reinforced around both ends by iron bands. Racks are of 1-inch black iron pipe, with thread connections, the uprights running down through platform and rigidly secured by means of floor plates and large hexagon nuts. Furnished with swivel casters and with galvanized racks, at slight advance in price.

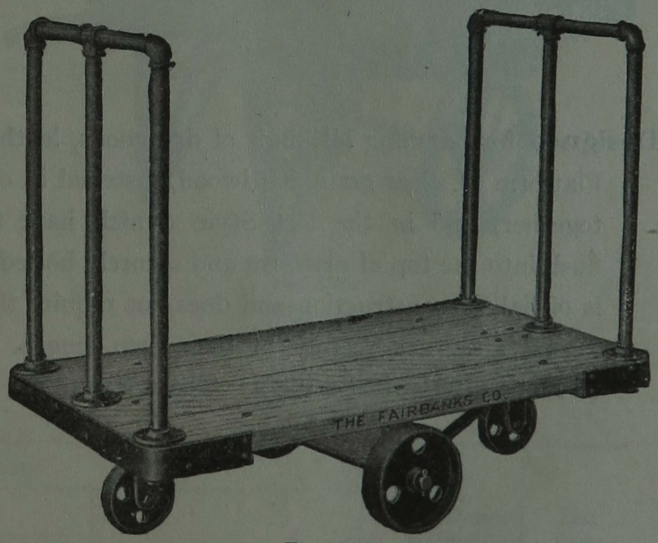


Fig. 2995
NO. R4335

Number	Dimensions in Inches									Approximate Weight, Pounds	List Price, Each
	Length Over All	Platform			Height of Racks	Height Over All	Wheels		Axle		
		Length Inside of Racks	Width	Height			Center	Caster			
R4156	47½	42	28½	11½	31	43	8x2½	8x2½	1 rd.	255	$55.70
R4335	52	46¼	27	11½	30	42	9x2½	6x1⅜	1¼ sq.	155	50.70

Dry Goods or Leather Trucks

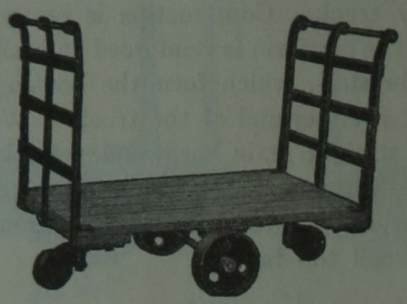


Fig. 2996

NO. S4100
Swivel Caster
(No. 244 Style Rack, Heavy)

Fig. 2997

NO. R4100
Rigid Caster
(No. 243 Style Rack, Light)

Designed for handling all kinds of dry goods, leather, etc. Very popular as a "piece goods" truck. Platform of clear-grain hardwood, fastened at ends and center with battens. Racks well riveted together, and in the 244 Style (which have three uprights), are reinforced by iron angles, set flush into the top of platform and securely bolted into place. The 243 Style, with two uprights, is of lighter construction and does not require this additional support. Trucks balance on center wheels and turn readily in their own length. Can be furnished with either No. R4100 rigid or No. S4100 swivel casters. The uprights are bent over an iron rod forming the handle grip.

Number		Style of Rack	Dimensions in Inches							Approximate Weight, Pounds	List Price, Each, R or S Style
			Length Over All	Platform			Wheels		Height of Racks	Axle		
Swivel Caster	Rigid Caster			Length	Width	Height	Center	Caster				
S4121	R4121	(243–1)	49	42	24	9½"	7½x2	4¾x1¼	27	1 rd.	150	$34.50
S4124	R4124	(244–2)	52	45	27	11½	9 x2½	4¾x1¼	27	1 rd.	210	43.15

Three-Wheel Barrow

Fig. 2998
NO. 180

Number 180 was designed for use of printers, paper dealers, lithographers and all who do a general package delivery business. Made from first-class stock, well braced to stand the rough usage to which these barrows are subjected. Handles are of well seasoned, straight-grained hardwood, of original design. Wheels have steel rims and spokes, with pressed steel hubs and gray iron box. Special pattern of axle box on front wheel.

All wood parts painted dark green with white striping; iron parts black.

Ham or Bacon Truck

Number 230 truck is used chiefly in packing houses. Made of hardwood and varnished in the natural color. Reinforced legs. Beveled-edge top. Wheels have staggered wrought spokes and cast iron rims and hubs.

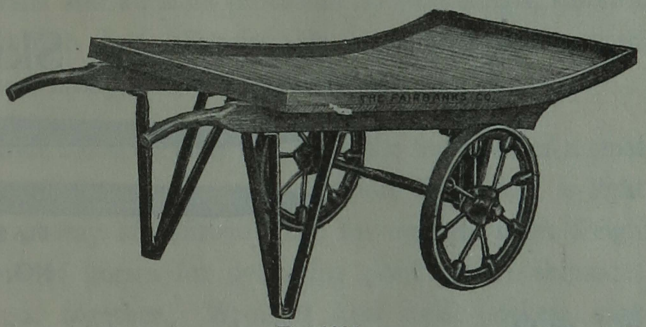


Fig. 2999
NO. 230

Number	Dimensions in Inches								Approximate Weight, Pounds	List Price, Each
	Length Over All	Width Over All	Body, Inside				Wheels	Axles		
			Length	Width at Front	Width at Rear	Depth				
180	68	28	28	19	23	12	16⅞x1½	1 & ⅞	110	$35.45

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Platform		Height of Platform Over Legs	Wheels	Axle		
	Length	Width					
230	78	63	24½	20x2	1¼ rd.	235	$41.25

Coal Charging Wagons

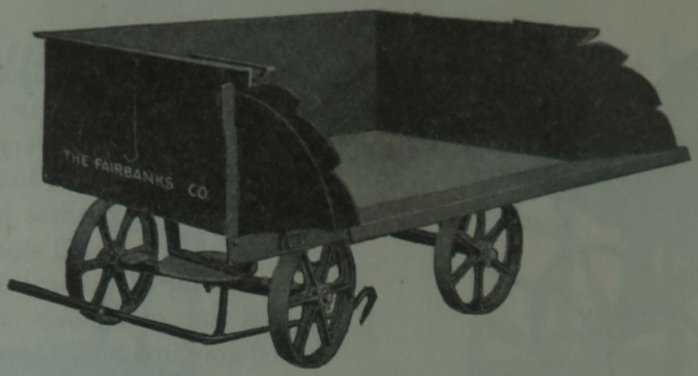


Fig. 3000

NO. 347

Coal Charging Wagons are designed for handling coal from bunkers to furnaces in boiler rooms. Here is a wagon well built in every particular. Sides are of No. 12 gauge, bottom of No. 10 gauge Sheet Iron, thoroughly well braced and reinforced to withstand the continued hard usage to which these wagons are subjected. Wheels on No. 347 wagon are of *malleable iron*, on No. 346 *cast-iron*. Large diameter fifth wheel. Regularly furnished with one drop side.

Skids

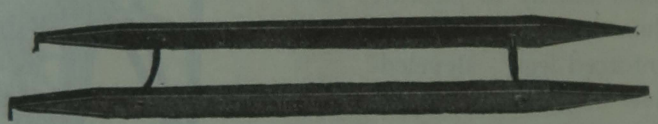


Fig. 3001

NO. 228

Our Skids are constructed of selected straight-grained oak or ash, well finished in every respect. Particular attention has been paid to the construction where the iron shoes are fitted to the rail—no rough projections on which to tear barrels or cases.

Numbers	Dimensions in Inches									Approximate Weight, Pounds	List Price, Each
	Body, Inside			Coal Capacity		Wheel Base (Outside)	Tread	Diameter of Wheels	Axles		
	Length	Width	Depth	Cu. Ft.	Pounds						
346	54	30	13	10	500	27	27	12x3	1½ sq.	430	$55.00
347	60	36	18	20	1000	32	29	16x2	1½ sq.	500	65.00

Numbers	Length, Feet	Dimensions in Inches		Number of Cross Bars	Approximate Weight, Pounds	List Price, Each
		Width Inside of Rails	Size of Side Rails			
228	7H	12½	1¾x3½	2	40	$11.55
	8H	12½	1¾x3½	3	44	12.45
	10H	12½	1¾x3¾	3	53	13.90
	12H	13½	1¾x4	4	72	16.10

Baggage Barrows

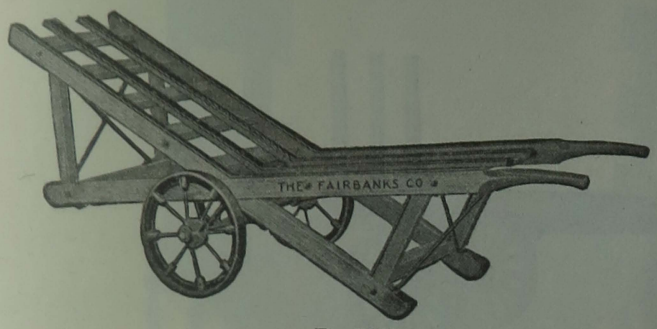


Fig. 3002

NO. 256

Express or Baggage Wagon

New England Pattern

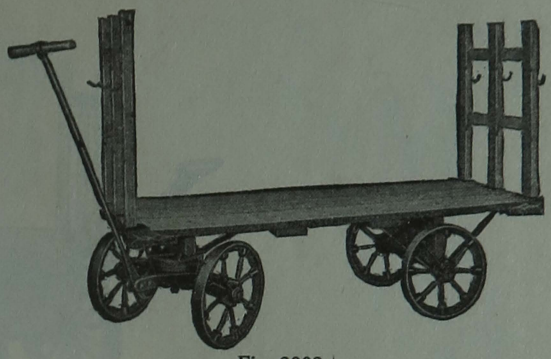


Fig. 3003

NO. 261

Number 256 baggage barrow is very popular with the commissary departments and transportation companies in the handling of baggage, mail bags, etc. Frame of selected hardwood, thoroughly counterbraced with iron rods. Tops of side rails and all slats protected by iron straps, fastened with countersunk head screws. Feet are all iron shod. Special axle boxes, staggered wrought spokes, style "K" wheels. Wood parts painted dark green, iron parts black.

Number 261 is of lighter construction than **Number** 257A, on page 663, and fills the need of a small wagon. A very serviceable express wagon for small outlying stations where the traffic is light. Frequently used by factories along the right-of-way of railroads, not far enough from freight stations as to really require the use of a team of horses for delivering products for shipment. Constructed of selected materials and well put together. Wrought steel stake pockets, staggered wrought spoke wheels. Woodwork painted bright red and green, iron work black.

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Length Over All	Height at Front	Height at Rear	Width	Wheels	Axle		
256–1	84	16	19½	24	18x2	1¼ rd.	215	$65.00
2	112	21½	24	27	20x2	1¼ rd.	300	75.40
3	114	21½	25	30	20x2	1¼ rd.	325	78.10

Number	Dimensions in Inches						Approximate Weight, Pounds	List Price, Each
	Platform			Height of Racks	Wheels	Axles		
	Length	Width	Height					
261	84	30	22½	36	18x2	1¼ sq.	425	$87.80

Express or Baggage Wagons

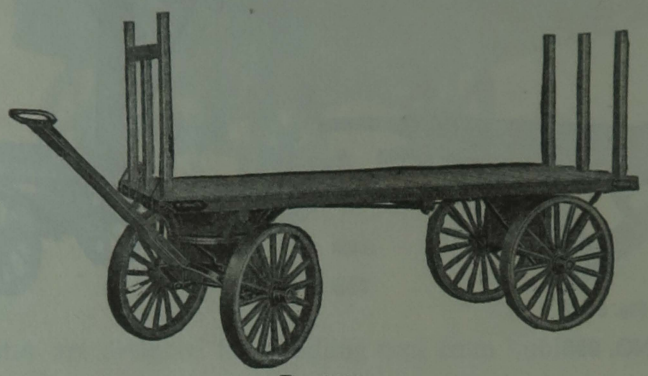


Fig. 3004

NO. 257A

With Sarven Wheels

Number 257A express or baggage wagon has been adopted by many leading railroads and express companies as standard. Well made and constructed on approved lines, using the best material throughout. Wood parts of hardwood. 20-inch steel fifth wheel. Platforms painted green, wheels and running gears vermilion.

If desired, this wagon can be furnished with counter-weighted tongue or a spring attachment, which holds the handle off the ground when wagon is not in use, at slight additional cost.

Furnished either with Sarven or Steel wheels. Removable end rack. Top edge of platform protected by iron strapping.

Number	Dimensions in Inches								Approximate Weight, Pounds	List Price, Each
	Platform			Racks		Wheels		Axles		
	Length	Width	Height	Width	Height	Front	Rear			
257A	120	39	35	32½	36	28x3½	28x3½	1½ rd.	635	$117.65

Trailer Trucks

Fig. 3005
No. 395
Full View

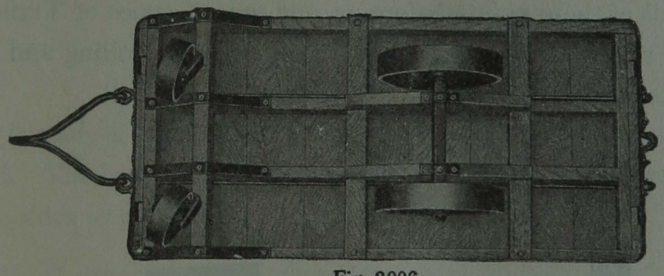


Fig. 3006
No. 395
Under View

Fairbanks Trailer Trucks, for use with industrial tractors, came into general use some years ago.

This system does away with the number of truckmen required to operate under the old methods. It reduces the cost of handling to the minimum and speeds up transportation to the highest degree. Efficiency of the system is increased with the number of trailers used and still greater efficiency depends on the quality and kind of equipment.

Tests made by U. S. Government, railroads, express companies, steamship companies, and many leading manufacturing plants, in freight transportation, have proved that the old types of platform trucks will not stand the severe work the trailer truck is called upon to perform.

We have taken advantage of the knowledge and advice of various efficiency engineers and this, coupled with our years of experience in truck building and manufacturing, enables us to offer the Fairbanks Trailer Trucks in several types and sizes to meet all requirements.

Trailer Trucks

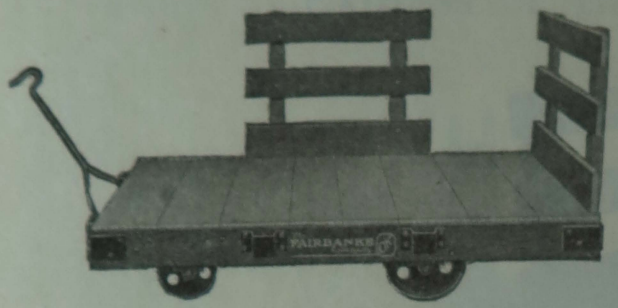


Fig. 3007
NO. 351
Full View

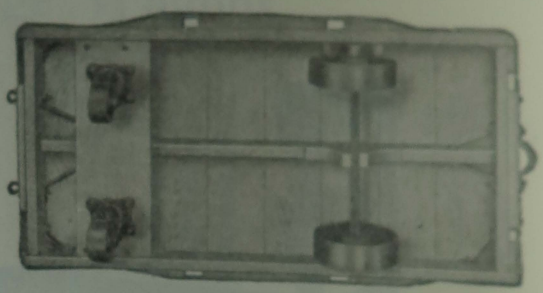


Fig. 008
NO. 351
Under View

Time and tests have proved that there is no economy in the use of inferior equipment. If one trailer truck in a train of four or five trucks proves defective it will cause unnecessary delays, waste of time and will decrease the efficiency of the system.

Keeping all of these points before us, our several types of Trailer Trucks have been designed and built along rugged and strong lines. They are easy rolling and constructed with the one idea of giving service and satisfaction.

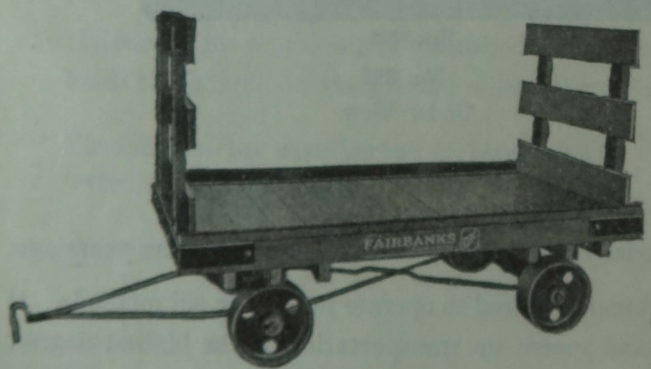


Fig. 3009
NO. 410
Full View

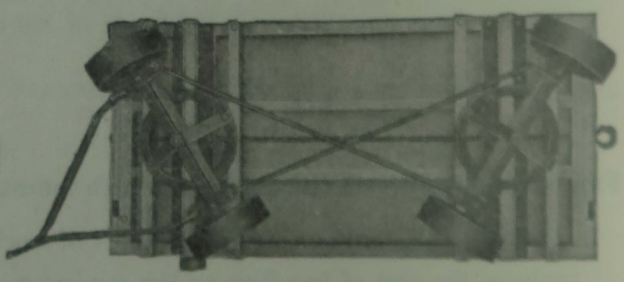


Fig. 3010
NO. 410
Under View

Types shown here are constructed of wood, wood end racks. We can furnish any type or size desired, wood or steel.

Will furnish special bulletins giving specifications, illustrations, prices, etc., upon request.

Fertilizer Cart

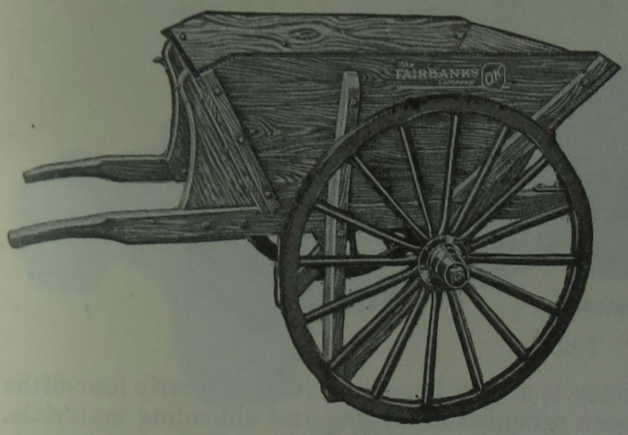


Fig. 3011
NO. 56

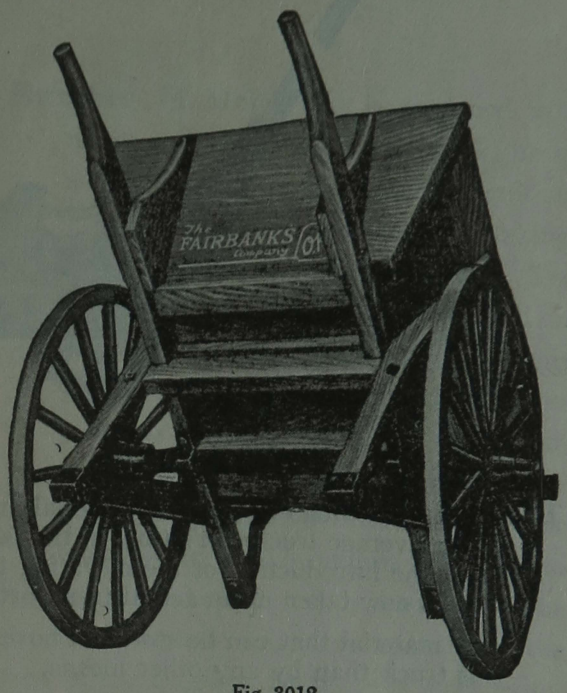


Fig. 3012
NO. 56

Fairbanks Improved Fertilizer Cart is made of high-grade seasoned hardwood, both box and frame. Box boards are tongued and grooved. The bottom is so constructed that it can be renewed, when worn through, without removing the sides or ends.

High-grade wood wheels, painted red; all other parts are given two coats of agricultural varnish.

This cart has an extra large axle, well bolstered underneath and attached to body with heavy steel cuff forgings. It is not possible for the axle to slip, thus allowing wheels to rub on the sides. Full size and number of bolts used. Box is strongly strapped on top, insuring protection. Legs and forward end of handles for dumping are protected by a steel shoe, well bolted on.

This cart is well made throughout and braced to stand the severe service expected of it.

Wheels and axle are so placed that even under the largest loads the balance is perfect and cart is unusually easy to operate.

Number	Dimensions in Inches								Approximate Weight, Pounds	List Price, Each
	Size of Box					Wheel Diameter	Size Tire	Size Axle		
	Length on Top Inside	Width on Top Inside	Depth	Length at Bottom	Width at Bottom					
56	46½	36	17½	24	23	36	1½x3/16	1½ sq.	246	$86.60

"Tranco" Elevating Trucks

Fig. 3013

"Tranco" Truck

The cost of moving the stock or material in any factory is a very important item. Nearly four-fifths of the average truckman's time in the past has been occupied in loading and unloading materials. With the introduction of the elevating truck this has been done away with, and the truckman's time is now taken up in actual transportation only, or assisting in work of a different nature.

Any material that can be stored in boxes, or on platforms, can be more economically moved with this truck than by any other means.

Platforms, either of wood or steel, can be made to meet any and all requirements and conditions.

The head is made of steel casting and securely riveted to the steel frame. The front wheel is equipped with ball bearings and suspended from a circular frame resting on ball bearings. Immediately in front is placed the quadrant for elevating the frame, around which a heavy chain travels and is securely attached to the front of the frame. The patent locking device, when truck is loaded, releases all the weight and strain from the chain and holds the frame in position until the load is relieved. On account of the swivel head the load can be raised or lowered at any position. This enables the truckman to operate in narrow aisle-ways.

All material is stacked on platform. To move material, the truck is backed under the platform; the handle of the truck is then pulled down, keeping the button depressed, which raises the truck bed and with it the loaded platform, at the same time automatically locking it in its raised position. To unload, the button is pressed and the handle raised, lowering the platform to the floor and—on account of the hydraulic check—without the slightest jerk or jar.

The pull required to move the "Tranco" truck on account of the ball bearings in the wheels is much less than required for a roller bearing truck, and the heavier the load, the greater the proportion in favor of ball bearings.

Number	Dimensions in Inches							Capacity Pounds	Weight Pounds
	Extreme Length (Platform Raised)	Extreme Width	Length from Platform Stop to Rear	Wheels	Height of Truck Elevated	Height of Truck Lowered	Clearance of Side Bar from Floor		
1726	39½	17	26	5½x2½	8⅛	6⅛	1⅞	1000	165
1736	51½	17	36	5½x2½	8⅛	6⅛	1⅞	2000	210
2436	51½	24	36	7 x2½	9½	7½	2½	2000	250
2448	64½	24	48	9 x3	12½	10½	4½	5000	420

Note.—These trucks are guaranteed for 50% overload.

We are prepared to furnish these trucks with rubber-tired wheels for use on hardwood floors.
Special sizes of platforms can be furnished on demand.
Prices quoted on application.

Motor Car

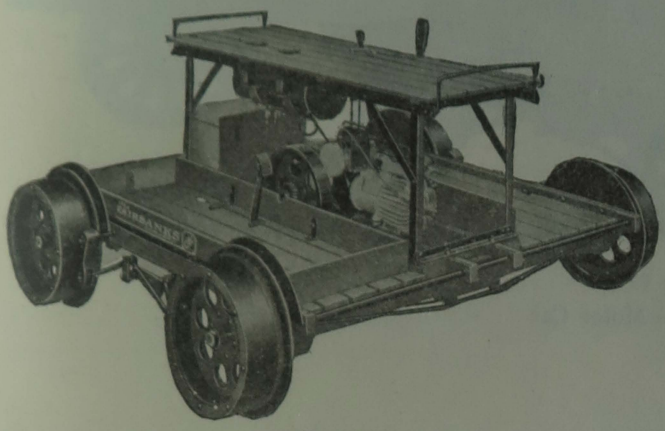


Fig. 3014

No. 16—Motor Car

Number 16 Motor Car is equipped with motor and seat in center of track, brake acting on four wheels. Magneto ignition. Free engine clutch. Started by cranking. One man can remove car from track. The motor was designed especially for this car and answers readily to the throttle. Being geared down to the drive axle, much more power is available than the direct connected cars using a larger motor. The magneto is driven by enclosed gears. The multiple disc clutch permits the motor to run idle when the car is standing. The car complete weighs no more than the one-sided motor cars of the same capacity and—because of the excellent balance—is more easily removed from the track by one man. A large tool tray is provided for equipment and also a tool box under the seat. It is positively the safest light car yet constructed and can be operated at speed without danger on curves, switches and crossings. It runs with the same degree of safety in either direction.

SPECIFICATIONS

POWER 3 H. P. Single Cylinder; improved two cycle; reversible air cooled motor; 3½-inch bore by 4-inch stroke; Dixie high tension magneto ignition. Battery ignition optional.

DRIVE Multiple Disc Clutch, giving free engine. High duty roller chain to rear axle.

SPEED 3 to 25 miles per hour, either direction.

WHEELS All 17-inch diameter, wood center, 3/16-inch tire, 1/8-inch optional.

BRAKE Lever operated toggle brake on four wheels.

GENERAL Hyatt Roller Bearings throughout.
Weight, 400 pounds.
Shipping weight, 450 pounds.
Will carry three men and tools.

Motor Car

Fig. 3015

No. 25—Motor Car

Number 25 Motor Car was designed to fill the requirements of a steady, powerful car, capable of continuous operation at work for which the so-called Section Motor Car has been found unsuited. Will carry from 12 to 24 men.

SPECIFICATIONS

POWER 16 H. P. four cylinder; four cycle; water cooled motor; 2⅞-inch bore by 4-inch stroke. Mechanical lubrication. Dixie high tension magneto. Thermo-syphon cooling. Motor is a standard automobile engine.

DRIVE Friction disc type. Heavy cast-iron disc with hardened shaft, running in high duty roller and ball bearings. Take-up box, mounted on engine unit. Fibre wheel, slides on heavy double keyed counter-shaft, hardened and running on Hyatt Roller Bearings. Heavy roller chain drive from counter-shaft to rear axle. Axles carried on Hyatt Roller Bearings with ball thrust at each wheel hub. Three speed ratios in both directions.

FUEL 7-gallon tank, giving an average of 200 miles on one filling.

WHEELS 20-inch Kalamazoo reinforced steel, ⅜-inch tire (insulated when specified).

BRAKES Lever operated toggle brake on four wheels.

GAUGE Standard 4 feet by 8½ inches.

SPEED 2 to 25 miles per hour. Can be geared 2 to 50 miles.

FRAME 7 feet 6 inches long of 3-inch channel. Wheel base, 60 inches. Tow irons are provided at each end of frame for attaching trailers.

WEIGHT 1,510 pounds.

We are prepared to furnish motor cars for any class of work. All prices on application.

Push, Hand and Velocipede Cars

Fig. 3016
NO. 16—Push Car

Number 16 Push Car is standard with platform 7 feet long, 5 feet 8 inches wide; 1½-inch axles, standard taper wheel fit. Brass bearings; 20-inch diameter improved pressed steel wheels; end strapped with iron. Frame and deck of seasoned hard wood. Standard gauge, 4 feet 8½ inches. Weight, 475 pounds. We can furnish ten different styles of push cars, standard and special, in any gauge desired. Prices on application.

Number 1 Standard Section Hand Car, 6 feet long, 4 feet 4 inches wide. Platform and wood parts are of hardwood. Axles 1½ inches; bearings 3 inches; 20-inch diameter improved pressed steel wheels; machine cut gears; flexible steady box; double acting brake; specially stout gallows frame, thoroughly trussed. Standard gauge. Weight, 510 pounds. We can furnish sixteen different styles of hand cars, standard and special, in any gauge desired. Prices on application.

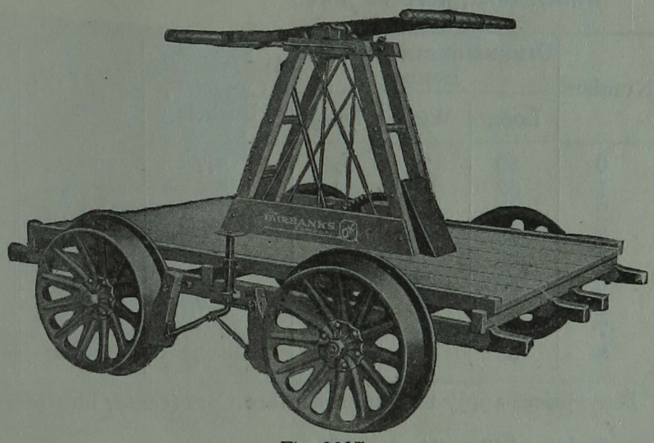


Fig. 3017
NO. 1
Standard Section Hand Car

Fig. 3018
NO. 12
Wood Frame Velocipede Car

Number 12 Wood Frame Velocipede Car. Wood-filled wheels, 20, 17 and 14-inch diameter; cut gears; highest grade ball bearings and tool steel axles. Standard gauge. Weight, 150 pounds. Adjustable arm for different gauges can be supplied. We can furnish twenty different styles of velocipede cars, steel and wood frames; standard or narrow gauge. Prices on application.

Fairbanks Fibre Warehouse Cars

Fibre Steel-Clad Car

Fig. 3019

Standard Fibre Car

Fig. 3020

Fibre Car with Wood Cover

Fig. 3021

Fairbanks Standard Fibre Cars are of light, strong construction, and with fair usage are practically indestructible. Mounted on self-oiling casters. Made in the following standard sizes—*Inside dimensions, fibre to fibre:*

Number	Dimensions in Inches—Inside			Approximate Capacity, Bushels	*List Price Each	Number	Dimensions in Inches—Inside			Approximate Capacity, Bushels	*List Price Each
	Long	Wide	Deep				Long	Wide	Deep		
0	30	21	20	5.7	$23.05	9	38	21	28	10.33	$28.85
1	32	18	18	5	21.95	10	40	15	24	6.66	26.00
2	33	20	27	8.25	26.70	11	40	27	27	13.5	31.40
3	36	18	20	6	24.15	12	42	24	28	13	31.40
4	36	18	24	7	25.60	13	42	30	30	17.5	34.30
5	36	20	18	6	24.15	14	48	30	30	19.6	36.50
6	36	20	26	8.75	27.05	15	52	32	36	27	40.90
7	36	24	24	9.3	27.80	16	56	34	36	32	43.05
8	36	28	31	14.5	31.80	17	60	36	36	35	45.25

*These prices apply to Standard Fibre Cars (center illustration) only and in quantities of from 1 to 11.

In lots of 12 to 24—less 5%
In lots of 25 and more—less 10%

SPECIAL SIZES TO ORDER

EXTRAS:
Steel Clad Construction
Wood Cover
Fibre Cover
Rubber Tired Wheels
Divine Cushion Wheels
} On application

Cans, barrels, mill baskets and shipping boxes on application.

Fibre Can

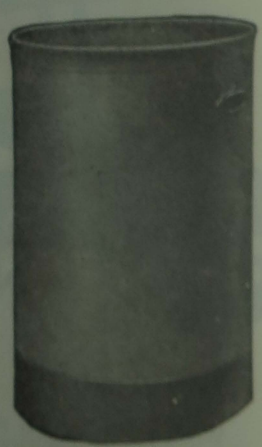


Fig. 3024

Fibre Car with Drop Side

Fig. 3022

Mill Basket

Fig. 3023

Push Carts

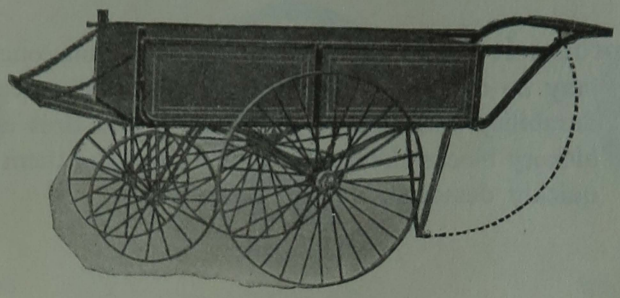


Fig. 3025

NO. 177

Fairbanks Pioneer Push Carts are furnished in twenty-three different sizes and types. Well constructed and substantial throughout. Can be furnished with steel or wooden wheels.

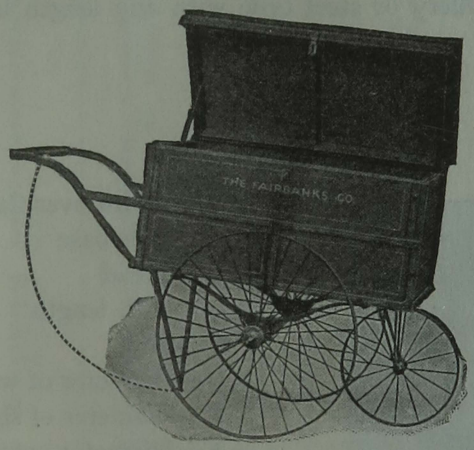


Fig. 3026

NO. 179

Pioneer Push Cart Wheels are stronger and more durable than all others. One piece of wire forms two spokes. This, together with the manner in which the wire is held between the hub flanges, gives the strongest possible construction.

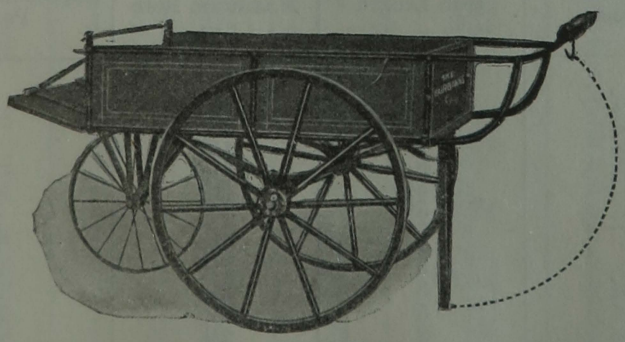


Fig. 3027

NO. 176

For further information and detailed description write for Pioneer Push Cart Catalogue.

"Nokut" Protective Tread Wheels

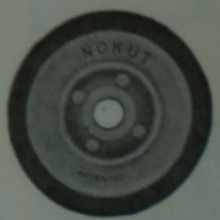


Fig. 3028
The Complete Wheel

A protective tread wheel designed for use on concrete floors, over which they may be operated without injury. These wheels are superior in point of durability and ease of operation. The tires are composed of a series of hickory blocks chemically treated to make them water-proof. The tires are quickly demountable and renewable.

These wheels are especially adapted to baggage trucks, express wagons and other trucks about depots, stations and factories where concrete floors are used. For express wagons we can supply wheels with "NOKUT" treads of the Savern pattern, artillery or steel type with any length hub or size bore.

Fig. 3029
The Complete Tire

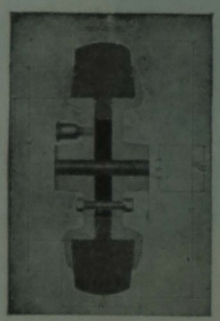


Fig. 3030
Sectional Wheel

A—Width over flanges
B—Tire base
C—Tread
G—Hub length
S —Bore
D—Diameter of wheel
F—Diameter of shoulders
E—Diameter over flange
H—Width of hub

Diameter, Inches	Width Tire at Base	Hub Length	Maximum Bore	Approximate Weight, Pounds	List Price, Each
4	1¼	2	¾	3	$ 2.00
5	1¼	2	1	3	2.50
6	1½	2	1¼	6	3.25
7	1½	2	1¼	7¼	4.00
8	2	2½	1¼	12	5.00
9	2	2½	2	14	6.50
10	2	3	2½	15	8.00
11	2	3	2½	20	9.00
12	2¼	3	2½	25	10.00
14	2¼	3	2½	35	12.00
16	2½	3	2½	46	14.50
18	2½	3½	2½	60	17.50
20	2½	3½	2½	70	20.50

Larger diameters, 22 to 42-inch, prices on application. For fractional sizes, apply list next largest size.

Fairbanks Cast-Iron Truck Wheels

Fig. 3031

Style "D"

With Solid Web

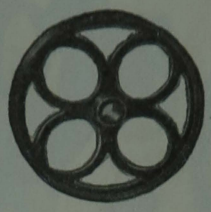


Fig. 3032

Style "L"

Fig. 3033

Style "E"

With Holes in Web

STANDARD SIZES

Wheel Number	Dimensions in Inches					Approximate Weight, Pounds	Style	List Price	
	Diameter	Face	Hub					Plain Iron	*Rubber Tired
			Length	Diameter	Bore				
118	4	2	2	1½	⅞	3	D	$0.65	$ 1.95
124	5	1½	2	1½	⅞	3¾	D	.70	1.90
125	5	2	2	1¾	¾	5½	D	1.00	2.35
129	5½	2	2	1½	½	4¾	D	.90	2.60
132	6	1½	2	1½	⅝	4½	E	.90	2.25
133	6	2	2	1½	¾	5¾	E	1.05	2.95
133X	6	2	2	2	¾	6½	E	1.15	3.05
135	6	3	2	2½	¾	9½	E	1.60	4.45
143	7	2	2	2	¾	7½	E	1.35	3.50
148	7½	2	2	2	⅞	8¼	E	1.50	3.85
149	7½	2½	2	2	¾	12	E	2.00	4.90
152	8	2	2½	1¾	¾	9½	E	1.65	4.15
153	8	2½	2½	2¼	¾–⅞	11	E	1.90	4.90
153P	8	2½				12	E	2.00	5.00
154	8	3	2½	1⅞	⅞	13¾	E	2.30	6.10
156	8	4	2½	2	⅞	14¾	E	2.40	7.45
159	8½	2½	2½	2	⅞–1	12	E	2.00	5.15
165	9	2½	2½	2	⅞	15¾	E	2.55	5.85
171	9½	2½	3	2¼	1	15½	E	2.50	6.10
172	9½	3	3	2¼	1⅛	19¼	E	3.05	7.35
172P	9½	3				17¼	E	2.80	7.10
174	9½	4	3	2¼	1	23¾	E	3.80	9.70
177	10	2½	3	2¼	⅞	18½	E	2.95	6.80
177P	10	2½				18¾	E	2.95	6.80
189	11	2½	3	2½	1	21¼	E	3.35	7.60
190	11	3	3	2½	1	20¾	E	3.20	8.30
195	11½	2½	3	2½	1¼	23	E	3.55	7.95
195P	11½	2½			1¼	22	E	3.40	7.80
401	12	2	3	2½	⅞	21	E	3.35	7.15
402	12	2½	3	2½	1	20¾	E	3.20	7.95
403	12	3	3	2½	1	22¾	E	3.50	9.00
405	12	4	3	2½	1¼	33¼	E	5.05	12.60
419	13½	2	3	2½	1⅛	27½	E	4.30	8.65
426	14	2½	3	2½	1	36¼	E	5.45	10.80
426P	14	2½				33	E	5.00	10.35
427	14	3	3	2½	1⅛	34	E	5.15	11.55
429	14	4	3	2½	1⅛	42	E	6.35	14.90
442	15½	2½	3	2½	⅞	27¼	E	4.20	10.20
448	16	3	3	3	1⅛	62½	D	9.40	16.80
†216	18	3½	3	2¼	1⅝	45	L	6.70	16.40
†234	18	2¼	3	2⅜	1⅝	38	L	5.80	12.05
236	12	2	2½	2⅛	1½	17¾	L	2.85	6.65
237	6	1¼	2	1¼	½	3	L	.65	1.80
238	9	1½	2½	1½	½	9½	L	1.65	3.55
239	9	2½	2½	1¾	½	12¼	L	2.10	5.40
XL	3¼	1⅜	1	1⅜	¾	1½	D	.45	1.25
O	3½	⅞	1	1	⅝	1¼	E	.40	1.20
XLI	3¾	2⅜	2	1⅜	¾	3¾	D	.80	2.15
XIX	3⅞	1⅜	1 7/16	1¼	⅝	2	D	.50	1.40
XXVII	4¾	1¼	1 7/16	1¼	½	2¼	D	.55	1.50
XXXVI	6	1⅜	1 9/16	1⅜	½	4	E	.85	2.15

* Vulcanized Rubber Tires, ¼ inch thick, which will increase diameter of wheel ½ inch.
† Vulcanized Rubber Tires, ⅜ inch thick.

Cast-Iron Truck Wheels

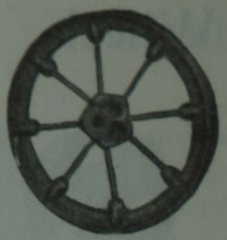


Fig. 3034

Style "K"

With Wrought-Iron Spokes and Cast-Iron Hubs and Rims

Rubber Tired Truck Wheels

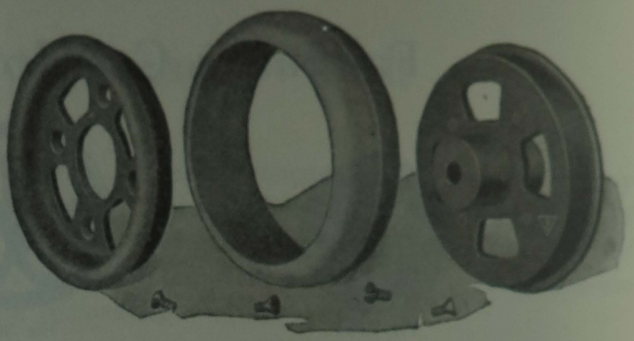


Fig. 3035

Style 12

This wheel is constructed in two parts, the moulded rubber tire being clamped between the two iron flanges, and the whole securely fastened together with machine screws. A very substantial and convenient type of wheel. Can be used on the finest floors. Tires can be replaced, without trouble, at any time.

STYLE "K"

Wheel Number	Dimensions in Inches							Approximate Weight, Pounds	List Price	
	Diameter	Face	Hub			Spoke			Plain Iron	†Rubber Tired
			Length	Diameter	Bore	Size	Style			
211	16	2	3 3/8	1 3/4	7/8	1/2	Straight	26	$ 4.50	$11.85
212	16	2 1/2	3 3/8	1 3/4	7/8	1/2	Straight	29	4.95	13.90
550	18	2	3 1/2	2 3/4	1 1/8	5/8	Staggered	38 1/2	6.40	14.70
551	18	2 1/2	3 1/2	2 3/4	1 1/8	5/8	Staggered	39 1/2	6.55	16.18
552	18	3	3 1/2	2 3/4	1 1/8	5/8	Staggered	58	9.10	21.70
553	18	3 1/2	3 1/2	2 3/4	1 1/8	5/8	Staggered	51 1/2	8.20	22.80
582	20	2	3 1/2	2 1/2	1 1/8	9/16	Staggered	42 1/4	6.90	16.25
583	20	2 1/2	4 3/4	2 1/2	1 1/8	9/16	Straight	60 3/4	9.50	20.95
584	20	3	3 1/2	2 1/2	1 1/8	9/16	Staggered	50	8.00	21.75
596	22	2	3 1/2	2 1/2	1 1/8	9/16	Staggered	48	7.70	17.70
598	22	3	3 1/2	2 1/2	1 1/8	5/8	Staggered	52	8.30	23.40
600	24	2 1/2	4 3/4	2 1/2	1 1/8	3/4	Straight	97	15.15	28.85

† Vulcanized Rubber Tires, 3/8 inch thick, which will increase diameter of wheel 3/4 inch.

STYLE No. 12

Dimensions in Inches						Price, Each	
Outside Diameter	Inside Diameter	Width of Tire Face Outside	Hub Length	Hub Diameter	Bore	Wheel Complete	Tire Only
2	1 1/4	3/4	15/16	9/16	21/64	$ 1.00	$ 0.45
2 1/2	1 9/16	1	1 5/16	5/8	21/64	1.35	.50
3	2 5/16	1 1/16	1 3/8	3/4	25/64	1.50	.60
4	3	1 1/4	1 9/16	1	25/64	1.95	.90
5	4 1/8	1 1/4	2	1 3/8	33/64	2.95	1.10
6	5	1 11/16	2	1 9/16	33/64	4.20	2.05
7	6	1 13/16	2 1/2	1 15/16	41/64	5.60	2.90
8	7	1 3/4	2 1/2	2	41/64	7.10	3.35
9	8	2 3/32	2 5/8	2 1/4	41/64	9.00	5.00
10	8 3/4	2 1/4	3 1/4	2 1/4	41/64	10.95	6.20
12	10 5/8	2 3/8	3 3/8	2 7/16	1 3/64	13.75	7.15
16	15	2 1/4	3 1/2	2 1/2	1 1/64	21.25	10.25

STYLE "AA"—Light Pattern

6	5	1 1/4	2	1 3/16	41/64	3.05	1.65
7	6	1 1/4	2	1 3/8	41/64	4.05	1.90
8	7	1 3/8	2 5/16	1 1/2	41/64	5.20	2.50

Caution.—Customers sometimes experience trouble in ordering tires for their wheels, on account of not giving necessary dimensions. In every instance, where the style and size of the wheel are not known, inside dimensions should be given.

Divine Cushion Wheels

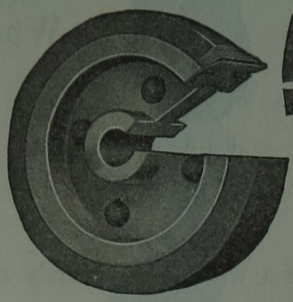


Fig. 3036
NO. 3

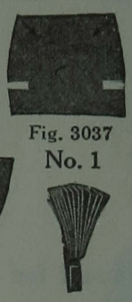


Fig. 3037
No. 1

Fig. 3038
NO. 2

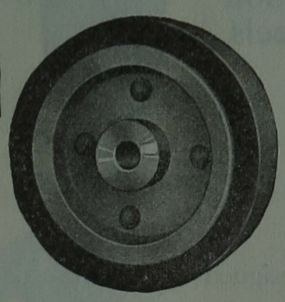


Fig. 3039
NO. 4

The Divine Cushion Wheel consists of a practically indestructible, noiseless, shock-absorbing tire of especially woven strong *cotton duck*, assembled under heavy compression between steel plates.

The *cotton duck* is so arranged that only the *ends* of the *threads* are presented to the wearing surface. Note in the illustration that the *cotton duck* stands on *edge* crosswise to the wheel and the threads run down diagonally through the tire.

The tire does not flatten under load and can neither cut, chip, crack, split nor tear out. Water, grease, oil, high or low temperatures will not affect it.

The Divine Cushion Wheels will stand more abuse than any other form of cushion wheel made, and will wear indefinitely. They are especially well adapted for use on general store, warehouse, railroad and packing-house trucks; portable grain hoppers, bread racks, kitchen and laundry trucks, portable scales, dry-room trucks, metal and other office furniture, bankers' money and book trucks, rolling ladders, escalators, portable oil tanks, storage battery power trucks and trailers, and many other devices requiring cushion wheels.

Cushion wheels are essential where quiet is desired, and for the preservation of tile, concrete, brick, wood or other floors from damage.

Number 1—Piece of canvas from cross section of tire. Note that ends of threads form the wearing surface, with balance of threads well anchored in the cloth, allowing no chance for unraveling.
Number 2—Twelve layers of canvas sewed together, forming block.
Number 3—Wheel showing individual pieces of canvas, one after the other, with threads crossing diagonally through the tires.
Number 4—Finished wheel.

GUARANTEE

The Divine Cushion Wheels are guaranteed by us as to material and workmanship for one year from date of sale.

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Diameter	Face	Width at Base of Tread	*Hub Length	*Hub Bore		
51	2½	¾	⅞	1⅜ or less	33/64 or less	½	$0.95
52	3	1	1 3/16	1⅝ or less	33/64 or less	⅝	1.25
53	3½	1	1 3/16	1¾ or less	33/64 or less	1	1.50
54	4	1⅛	1¼	1⅞ or less	33/64 or less	1½	1.75
55	4½	1 3/16	1 5/16	1⅞ or less	49/64 or less	2	1.90
56	5	1 3/16	1⅜	2¼ or less	49/64 or less	2⅛	2.25
57	6	1 7/16	1⅝	2⅝ or less	1 5/32 or less	4	3.30
58	7	1 9/16	1 11/16	2⅞ or less	1 5/16 or less	5¼	4.00
59	8	1¾	2	2⅞ or less	1 13/32 or less	7¼	5.60
60	9	1⅞	2⅛	3¼ or less	1 33/64 or less	8¼	7.50
61	10	2	2¼	3¼ or less	1 33/64 or less	10½	8.25
62	11	2	2¼	3¼ or less	1 33/64 or less	12¾	9.00
63	12	2	2 5/16	3¼ or less	1 33/64 or less	16¼	10.00
64	14	2	2 5/16	4 or less	2⅜ or less	20	20.00
65	16	2	2 5/16	4 or less	2⅜ or less	30	24.00
66	18	2	2⅜	4 or less	2⅜ or less	45	27.00
67	20	2	2⅜	4 or less	3½ or less	58	33.00

* These are the longest hub lengths and the largest bores that can be furnished from standard patterns. Longer hubs or larger bores are special. Shorter hub lengths and smaller bores than given above supplied at regular prices.

Divine Steel Casters

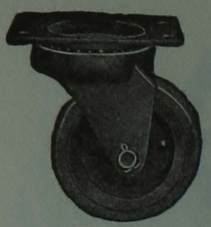


Fig. 3040

NOS. 351 to 359

Cushion Wheels

Fig. 3041

NOS. 251 to 259

Fig. 3042

NOS. 301 to 309

Steel Wheels

Fig. 3043

NOS. 201 to 209

Divine Casters are designed to meet the demand for a well-made, sturdy caster.

As *steel* is the only material used in the construction of these casters, they are practically *unbreakable*.

The thrust and bearing in the swivel caster are taken care of in two rows of balls, permitting easy traveling and delicate swiveling. This form of swivel causes the truck to respond instantly and to move in the desired direction.

All wearing parts in our steel casters are accurately machined. Axles are of steel, ample in size, and much larger than is customary.

The Divine steel swivel and rigid casters will out-wear many times over the ordinary iron casters, and will give long, satisfactory service, without the annoyance of binding and breaking, which is common to most other forms of casters.

Number	Dimensions in Inches					Approximate Weight Pounds	List Price, Each	Number with Hyatt Bearings	List Price with Hyatt Bearings
	Diameter	Height Over All	Diameter of Axle	Size of Plate	Diameter of Plate Bolt				
201	2½	2⅞	5/16	1 5/16 x 4	5/16	1⅝	$0.95	...	....
202	3	3¼	3/8	2¼ x 4	3/8	2¼	1.05	...	....
203	3½	3⅞	3/8	2½ x 4	3/8	2½	1.25	...	....
204	4	4⅜	½	3 7/16 x 5	3/8	3⅛	1.50	...	....
205	4½	4⅞	½	3 7/16 x 5	3/8	3⅝	1.90	...	....
206	5	5 7/16	½	3½ x 6½	½	5¼	2.30	227	$4.30
207	6	6 7/16	½	3¾ x 7⅜	½	7⅜	2.80	228	5.10
209	8	8½	¾	4⅜ x 8¼	½	11½	4.80	230	7.50
251	2½	2⅞	5/16	1 5/16 x 4	5/16	1¼	1.30	...	....
252	3	3¼	3/8	2¼ x 4	3/8	1⅞	1.70	...	....
253	3½	3⅞	3/8	2½ x 4	3/8	2¼	2.00	...	....
254	4	4⅜	½	3 7/16 x 5	3/8	2⅞	2.35	275	4.50
255	4½	4⅞	½	3 7/16 x 5	3/8	3⅝	2.65	276	4.75
256	5	5 7/16	½	3½ x 6½	½	5⅓	3.15	277	5.35
257	6	6 7/16	½	3¾ x 7⅜	½	7 1/16	4.40	278	7.10
258	7	7⅜	⅝	3¼ x 7¼	½	9⅓	5.40	279	7.90
259	8	8½	¾	4⅜ x 8¼	½	10⅞	7.40	280	9.60
301	2½	3½	5/16	3⅜ x 4 1/16	5/16	2¼	1.25	...	....
302	3	4½	3/8	3¼ x 4⅝	3/8	3½	1.80	...	....
303	3½	4¾	3/8	3¼ x 4⅝	3/8	3⅞	2.00	...	....
304	4	5¼	½	3¼ x 4⅝	3/8	4¼	2.20	...	....
305	4½	5¾	½	3¼ x 4⅝	3/8	4¾	2.60	...	....
306	5	6½	½	5⅜ x 7⅜	½	9	3.70	327	5.70
307	6	7½	½	5⅜ x 7⅜	½	10⅝	4.20	328	6.50
309	8	9½	¾	5⅜ x 7⅜	½	13¾	6.80	330	9.50
351	2½	3½	5/16	3⅜ x 4 1/16	5/16	1¾	1.60	...	....
352	3	4½	3/8	3¼ x 4⅝	3/8	3⅛	2.40	...	....
353	3½	4¾	3/8	3¼ x 4⅝	3/8	3½	2.75	...	....
354	4	5¼	½	3¼ x 4⅝	3/8	4 1/16	3.05	275	5.20
355	4½	5¾	½	3¼ x 4⅝	3/8	4¾	3.35	376	5.45
356	5	6½	½	5⅜ x 7⅜	½	9⅛	4.55	377	6.75
357	6	7½	½	5⅜ x 7⅜	½	10⅓	5.80	378	8.50
358	7	8½	⅝	5⅜ x 7⅜	½	12⅛	7.00	379	9.50
359	8	9½	¾	5⅜ x 7⅜	½	12¾	9.40	380	11.70

Swivel Casters

Fig. 3044

NO. R31
Style "AA"

Fig. 3045

NOS. R69, R7
R11, R9
R79

Fig 3046

*Style B70
B73
B74
B78

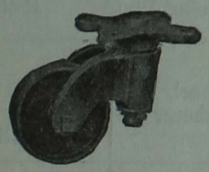


Fig. 3047

NO. R29
Style "AA"

Style "AA"

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Wheel	Height to Top of Plate	Plate, Size Over All	Plate, Holes C to C	Plate, Diameter of Bolts		
R29	4¾x1¼	6⅝	5x5	3½x3½	⅜	11	$2.60
R31	4¾x1¼	8⅝	5x5	3½x3½	⅜	12½	2.90

Style "BB"

With Long Stems and Brackets

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Wheel	Height to Bottom of Bolster	Height Over All	Plate, Holes C to C	Plate, Diameter of Bolts		
R69	4¾x1¼	7⅜	13⅝	2¼x2⅛	⅜	13¾	$ 3.65
R 7	6 x1⅜	9	15¼	2¼x2⅛	⅜	15	3.70
R11	8 x1½	11¾	21½	2⅜x6	⅜	26¼	5.45
R 9	6 x1⅜	9⅝	15¼	4¼x3¼	⅜	15½	3.90
R79	6 x1⅛	7½	13¼	3¼x3½	5/16	7½	2.85
*B70	8½x2½	11	18	3¾x4¼	½	40	9.05
*B73	9 x1½	11	17½	3¼x4¾	⅜	27	5.80
*B74	6 x1¼	7¾	13½	3 x4	⅜	15	4.00
*B78	8½x2½	11¼	18	3¾x4½	½	47½	11.00

*Ball bearing type.

Rigid Casters with Plain Iron and Rubber Tired Wheels

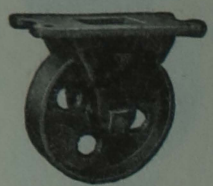


Fig. 3048

NO. 56
Rectangular Plate

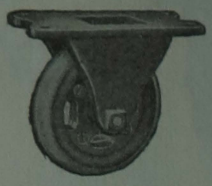


Fig. 3049

NO. 10
Rubber Tired

Fig. 3050

NO. 45
Offset Plate

Fig. 3051

NO. 35
Rubber Tired

Fig. 3052

NO. 58
Oblong Plate

Fig. 3053

NO. 11
Rubber Tired

Wheel, Diameter	Dimensions in Inches				List Price, Each	
	Height Over All	Size of Plate, Nos. 58, 11	Size of Plate, No. 56, 10	Size of Plate, Nos. 45, 35	Nos. 58, 45, 56	Nos. 10, 11, 35
2 x 3/4	2 1/2	3 3/16 x 3 5/16	1 7/8 x 3	2 3/16 x 3 1/8	$0.45	....
2 1/2 x 1	3	4 3/8 x 4 3/4	1 15/16 x 4	2 11/16 x 3 7/8	.55	$1.60
3 x 1 1/4	3 1/2	4 3/4 x 5 1/4	2 1/2 x 4 1/4	2 7/8 x 3 3/4	.65	1.85
4 x 1 3/8	4 3/4	5 3/8 x 5 7/8	2 7/16 x 5 3/8	3 7/16 x 5	.95	2.50
5 x 1 1/2	6	6 1/2 x 7 3/8	3 x 6 3/4	4 x 5 3/8	1.45	3.85
6 x 1 3/4	7	8 x 8 3/8	3 3/4 x 7 3/8	5 1/2 x 7 1/8	2.15	5.45
7 x 2 1/4	7 3/4	6 1/16 x 8 5/16	3 13/16 x 7 1/4	4 15/16 x 7 3/16	3.05	7.45
8 x 2 3/8	9	6 7/8 x 9	4 3/8 x 8 1/8	5 9/16 x 8 1/8	4.20	9.50

Heavy Pattern

STYLE "M"

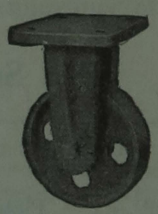


Fig. 3054

Number	Dimensions in Inches					Approximate Weight, Pounds	List Price, Each
	Wheel	Height Over All	Plate				
			Size Over All	Holes C to C	Diameter of Bolts		
R56	4 3/4 x 1 1/4	6 5/8	5x5	3 1/2 x 3 1/2	3/8	9	$1.85
R58	4 3/4 x 1 1/4	8 5/8	5x5	3 1/2 x 3 1/2	3/8	11	2.30
R60	6 x 1 3/8	8 5/8	5x5	3 1/2 x 3 1/2	3/8	12 1/2	2.30

Swivel Casters Ball Bearing Type

Fig. 3055

NO. 60
Plain Iron Wheel

Fig. 3056

NO. 59
Rubber Tired Wheel

Wheel	Dimensions in Inches			List Price, Each		Wheel	Dimensions in Inches			List Price, Each	
	Height Over All No. 60	Height Over All No. 59	Diameter of Bolts	No. 60	No. 59		Height Over All No. 60	Height Over All No. 59	Diameter of Bolts	No. 60	No. 59
2	2 7/8	2 7/8	1/4	$0.85	$2.00	5	6 1/2	6 1/2	3/8	$2.80	$5.20
2 1/2	3 5/8	3 5/8	5/16	.95	2.00	6	7 5/8	7 5/8	3/8	3.95	7.20
3	4 1/4	4 1/4	3/8	1.35	2.35	7	9 3/8	9 3/8	1/2	5.40	9.70
4	5 3/4	5 3/4	3/8	2.00	3.50	8	10	10	1/2	6.60	11.60

"Gem" Roller Bearing Truck Casters

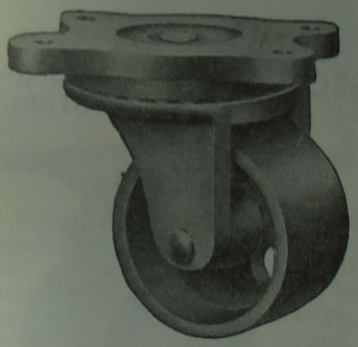


Fig. 3057

The "Gem" Truck Casters are constructed of cast-iron, with steel roller bearings and heavy steel axles.

Number	Dimensions in Inches					Price, Per Set of Four
	Wheel	Height Over All	Plate, Size Over All	Plate, Holes C to C	Plate, Diameter of Bolts	
*637	2 x 15/16	2 3/4	3 1/8 x 2 1/8	2 7/16 x 1	1/4	$1.25
837	2 1/2 x 1 3/16	3 5/8	4 x 2 7/8	3 1/4 x 1 1/2	5/16	2.75
937	3 1/8 x 1 3/8	4 1/4	4 7/16 x 3 3/8	3 5/16 x 2 1/8	3/8	4.00
1037	4 x 1 3/8	5 1/4	4 3/8 x 3 3/8	3 7/8 x 2 1/8	3/8	5.00
1137	5 x 1 1/2	6 1/2	5 11/16 x 4 7/16	4 3/4 x 2 1/4	3/8	12.00
1237	6 x 1 7/8	8	7 x 5 13/16	5 1/2 x 4 1/8	3/8	25.00
192	4 x 2 1/4	5 1/2	5 11/16 x 4 7/16	4 3/4 x 2 1/4	3/8	12.00
**1437	8 x 3	10	8 x 8	8 3/8 x 5 1/8	1/2	60.00

* Can be supplied with thread guard.

** Equipped with steel ball bearings.

"Yale" Double Wheel Truck Casters

Constructed of cast-iron, with frame loosely pivoted to plate and fitted with two wheels. Directly over the axis of these wheels and under the plate runs an anti-friction wheel. The weight rests upon and directly over the axis of the floor wheels and not upon the pivot.

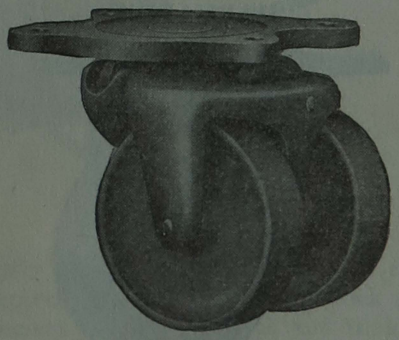


Fig. 3058

Number	Dimensions in Inches					Price, Per Set of Four
	Wheel	Height Over All	Plate, Size Over All	Plate, Holes C to C	Plate, Diameter of Bolts	
212	2 1/8 x 5/8	2 3/4	3 3/16 x 2 1/16	2 7/16 x 1 5/16	1/4	$1.25
232	2 3/8 x 9/16	3 1/8	3 7/16 x 2 1/4	2 5/8 x 1 11/16	1/4	1.50
282	2 3/4 x 11/16	3 5/8	4 x 2 1/2	3 1/4 x 1 25/32	1/4	2.00
332	3 1/4 x 13/16	4 1/4	4 1/2 x 3 1/4	3 9/16 x 2 5/16	5/16	2.50
402	4 x 1 1/8	5 1/4	5 11/32 x 3 33/32	4 9/32 x 2 5/8	3/8	6.00
502	5 x 1 5/8	7 1/2	7 9/16 x 5 1/4	5 13/16 x 3 9/16	1/2	16.00
602	6 x 2	8 1/2	7 9/16 x 5 1/4	5 13/16 x 3 9/16	1/2	20.00

"HARVARD" STEEL

Ball Bearing and Roller Casters

"GEM" STEEL

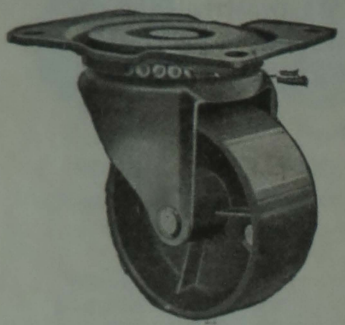


Fig. 3059

To meet the demand for an extra strong and inexpensive Truck Caster we are now offering the new steel line. Extra heavy gauge steel is used throughout the entire construction. Fitted with cast-iron wheels, hardened steel fork, and equipped with ball bearings in the "Harvard," and roller bearings in the "Gem."

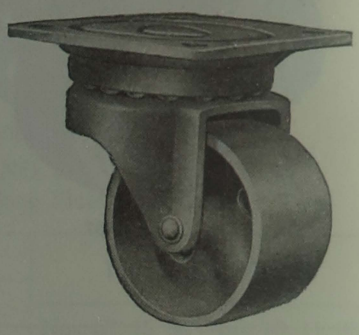


Fig. 3060

Number	Dimensions in Inches					Price, Per Set of Four
	Wheel	Height Over All	Plate, Size Over All	Plate, Holes C to C	Plate, Diameter of Bolts	
	"HARVARD"					
12421	2½x1 3/16	3 3/8	3¾x2¾	3 x1¾	¼	$2.75
13421	3⅛x1 3/8	4¼	4 x3⅛	3⅜x2⅜	⅜	4.00
14421	4 x1⅝	5¼	4 15/16x4	4 x3	⅜	5.00
	"GEM"					
351	1 1/32x ⅝	1⅝	1½x1½	.....	....	.42
451	1 3/16x ⅝	1¾	1½x1½	.....	....	.47
651	1⅜x 25/32	2	1⅞x1⅞	.....	....	.53
751	1½x 25/32	2⅛	1⅞x1⅞	.....	....	.60
851	1½x1	2¼	2¼x2¼	.....	....	.90
951	1⅞x1 1/16	2 9/16	2¼x2¼	.....	....	1.00

Thread Guard Casters

"HARVARD"

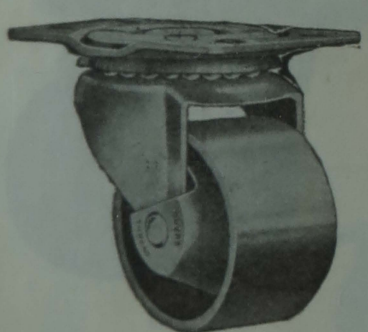


Fig. 3061

Thread Guard Casters are especially designed for use in shoe factories, cotton mills, etc., where lint and threads are constantly scattered on the floor.

The steel guard or protector on the side of the wheel and over the axle prevents threads from winding around the axle or interfering with freedom of action of the wheel and therefore can be used where the ordinary casters are not practical.

"GEM"

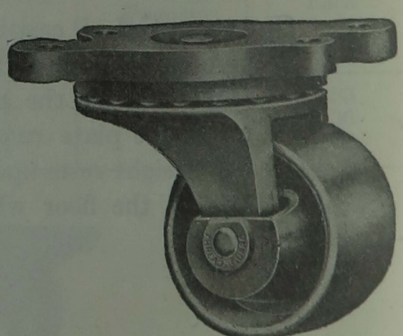


Fig. 3602

Number	Dimensions in Inches					Price, Per Set of Four
	Wheel	Height Over All	Plate, Size Over All	Plate, Holes C to C	Plate, Diameter of Bolts	
	"HARVARD"					
8421	1¾x1 1/16	2½	2 9/16x1⅞	2 x1⅛	¼	1.60
9421	2 x1 1/16	2⅝	2 9/16x1⅞	2 x1⅛	¼	1.75
	"GEM"					
4371	1⅝x 15/16	2¼	2 11/16x1½	2⅛x1	¼	$1.60
6371	2 x 15/16	2¾	3⅛x1⅝	2 7/16x1 1/16	¼	1.75

COAL BARROWS

Fig. 3063

Especially adapted for wheeling coal and ashes; tubular handles extend beyond the wheel to form a dumping rest and are riveted across the front of the tray to act as a brace; axle clips bolted to the tubular handles form bearings for the wheel axle; bottom of tray is 12 gauge and sides 16 gauge steel, all riveted and protected along the edge by a band of wrought iron; wheel of malleable iron; braced legs are securely bolted and riveted.

NOS.	4	5	6	7	8
Width Tray, Inches	29	31½	32	36	40
Length Tray, Inches	32	36	38	39	45
Diam. Wheel, Inches	16	16	16	16	16
Carrying Capacity, Lbs.	150	200	225	300	450
Weight Each, Lbs.	92	99	100	104	111
Each	**$12.25**	**14.25**	**15.00**	**18.00**	**20.00**

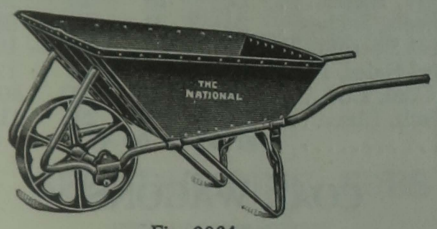


Fig. 3064

Construction and material identical to No. 4, but with square tray; regular type made of 14 and 10 gauge steel. Type A made of Nos. 12 and 10 gauge steel; type AA, of Nos. 12 and 8 gauge steel.

NOS.	9	10	11	12	13
Width Tray, Inches	32	33	35	36	38
Length Tray, Inches	34	36	38	40	42
Diam. Wheel, Inches	18	18	18	18	18
Carrying Capacity, Lbs.	260	340	400	480	600
Weight Each Regular Type, Lbs	123	126	135	139	145
Regular Type, Each	**$22.00**	**24.00**	**26.00**	**28.00**	**30.00**
Weight Each, Type A, Lbs.	135	145	148	153	155
Type A, Each	**$23.50**	**25.50**	**27.50**	**29.75**	**32.00**
Weight Each, Type AA, Lbs.	141	150	153	157	160
Type AA, Each	**$24.50**	**26.75**	**28.50**	**30.75**	**33.50**

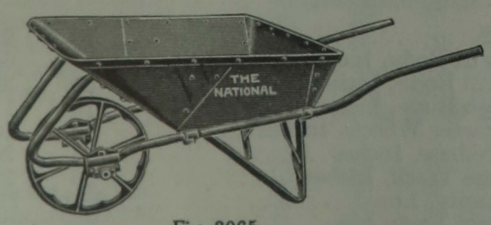


Fig. 3065

Expecially designed for apartment houses or narrow passageways; also used as a bunker barrow on board ship; construction and material similar to No. 9, but No. 16 gauge steel is used throughout.

NO.	6B
Length Tray, Inches	37
Width Tray, Inches	24
Diameter Wheel, Inches	16
Capacity, Lbs.	250
Weight Each, Lbs.	93
Each	**$23.50**

WHARF BARROWS

Fig. 3066

For use on docks and wharves or any place where heavy loads are handled on fairly smooth and level surfaces; wheel is placed well back under the load, which minimizes the weight on the hands of the user. Tray is of heavy sheet steel, firmly riveted and reinforced at the edges and corners; handles of seasoned hardwood; legs and braces are wrought flat iron securely bolted in place; wheels of malleable iron.

NOS.	60	61	62
Length Tray, Inches	41	44	44
Width Tray, Inches	29	30	30
Diameter Wheel, Inches	16	16	16
Carrying Capacity, Lbs.	200	250	300
Weight Each, Lbs.	98	102	110
Each	**$20.00**	**22.00**	**24.00**

NOS.	63	64	65
Length Tray, Inches	45½	49	52½
Width Tray, Inches	30	30	32
Diameter Wheel, Inches	16	18	18
Carrying Capacity, Lbs.	350	400	500
Weight Each, Lbs.	115	125	150
Each	**$26.00**	**28.00**	**30.00**

HOD ELEVATOR BARROWS

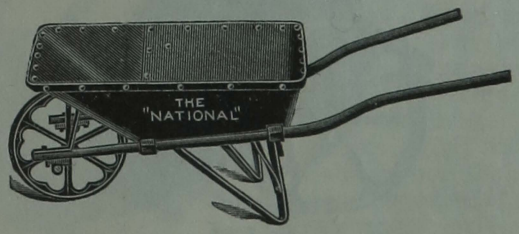


Fig. 3067

Designed especially for use on hod elevators for conveying concrete, gravel and asphalt; straight back and sides permit convenient handling of brick and tile also. Tray of 16 gauge steel is securely riveted and reënforced along the edge by a band of wrought iron; tubular handles are fastened to the tray by four iron clips and two braces, which also support the front of the tray; wrought iron legs are braced and riveted to tray and bolted to handle; wheels of malleable iron; axle turns in clips bolted to under side of tubular handle.

NO.	4C
Length Tray, Inches	33
Width Tray, Inches	25
Diameter Wheel, Inches	15
Carrying Capacity, Cubic Feet	4
Weight Each, Lbs.	75
Each	**$15.50**

COAL BARROWS

Fig. 3068

For coal conveying, mine or foundry use; body riveted and strongly reinforced; extra heavy bottom; two wide rimmed malleable iron wheels on a wrought iron axle, which is supported from the tubular handles by bolted clamps; handles project in front to form a dumping rest and a brace for front of tray.

Regular type tray, made of Nos. 14 and 10 gauge steel; Type A, of Nos. 12 and 10 gauge; Type AA, of Nos. 12 and 8 gauge.

NOS.	9½	10½	11½	12½	13½
Width Tray, Inches	32	33	35	36	38
Length Tray, Inches	34	36	38	40	42
Diam. Wheels, Inches	18	18	18	18	18
Carrying Capacity, lbs.	260	340	400	480	600
Weight Each, Lbs., Regular	156	163	165	168	165
Each, Regular	$28.00	30.00	32.00	34.00	38.00
Weight Each, Lbs., Type A	164	174	177	182	184
Each, Type A	$29.50	31.50	33.50	35.75	40.00
Weight Each, Lbs., Type AA	170	179	182	186	189
Each, Type AA	$30.50	32.75	34.50	36.75	42.00

CHARGING BARROWS

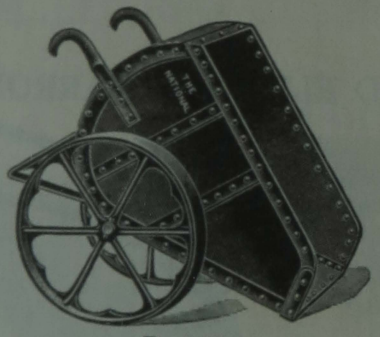


Fig. 3069

Especially adapted for charging blast furnaces, for use in gas works, boiler rooms, on coal docks and brickyards; very easily handled by one man when loaded to its capacity with any material not heavier than iron ore; easily dumped; constructed of heavy steel throughout; angle iron securely riveted to corners. Short, heavy iron handles riveted on each side of body; one-piece stand of wrought iron is securely riveted to body.

NOS.	18	19	20	21	22
Width Body, Inches	20	21	24	26	28
Depth Body, Inches	21½	25	26	28	30
Length Body, Inches	54	54	54	56	57
Diam. Wheels, Inches	28	28	28	32	32
Capacity, Cubic Feet	10	12	14	16	20
Weight Each, Lbs.	347	358	436	503	519
Each	$58.00	62.00	65.00	68.00	72.00

Note.—Nos. 21 and 22 have wrought iron wheels, balance malleable iron. Can be furnished with swivel legs at small additional cost.

CHARGING BARROWS

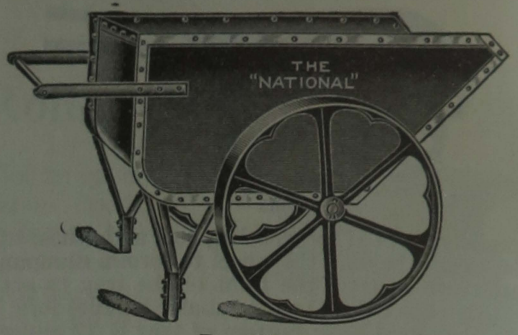


Fig. 3070

Used for coal or coke; light in weight, but strong and durable; easily handled by one man when loaded to capacity; can be emptied without difficulty; body of steel, securely bound with angle iron; firmly riveted; iron handles riveted to sides of body and braced with iron cross rod; two stands of flat bar iron riveted to body; wheels of malleable iron.

NOS.	1	2	3	4	5
Width Body, Inches	26	26	26	30	32
Length Body, Inches	42	43	48	48	48
Depth Body, Inches	17	18	20	24	26
Diam. Wheels, Inches	24	24	24	28	28
Gauge Steel Bottom, No.	12	12	12	10	10
Gauge Steel Sides, No.	14	14	14	12	12
Capacity Coal, Lbs.	400	500	600	800	1000
Weight Each, Lbs.	260	276	295	415	435
Each	$40.00	45.00	47.50	50.00	52.50

COAL WAGONS

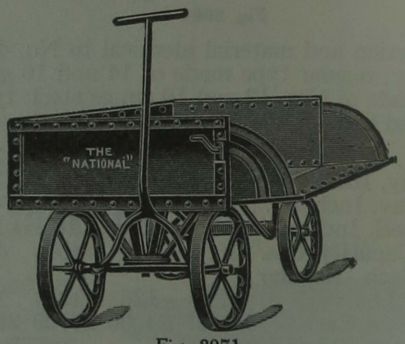


Fig. 3071

Used for conveying coal or coke; made of heavy steel, bound on corners with angle iron, securely riveted; pulling handle is solid iron rod, firmly fastened to front axle; one side of body may be lowered to permit easy emptying; malleable iron broad rimmed wheels; heavy steel axles. Will stand hard usage.

NOS.	20	21	22
Length Body, Inches	58	64	68
Width Body, Inches	30	32	34
Depth Body, Inches	10	11	14
Diameter Wheels, Inches	16	16	16
Wheelbase, Inches	24	26	32
Gauge Track, Inches	20	22	24
Capacity, Lbs.	550	715	1032
Weight Each, Lbs.	425	465	500
Each	$60.00	70.00	75.00

NOS.	23	24	25
Length Body, Inches	68	75	92
Width Body, Inches	36	42	41
Depth Body, Inches	14	15½	16
Diameter Wheels, Inches	16	16	16
Wheelbase, Inches	32	36	40
Gauge Track, Inches	24	30	30
Capacity, Lbs.	1210	1570	2035
Weight Each, Lbs.	565	625	750
Each	$80.00	90.00	110.00

CONTRACTORS' TIPPING TUBS

Fig. 3072

Used extensively by contractors; tips forward when catch is loosened and empties the load; sheet steel bucket securely riveted and strongly reënforced around the edge. Strong bail of drop forged steel.

NOS.	60	61	62	63	64
Length Bucket, Inches.	33	36	41	42	48
Width Bucket, Inches..	26	27	30	33	33
Depth Bucket, Inches..	19	22	24	25	27
Coal Capacity, Lbs....	300	400	500	600	700
Weight Each, Lbs.....	172	200	260	330	371
Each	$29.00	32.00	36.00	40.00	50.00

NOS.	65	66	67	68	69
Length Bucket, Inches.	44	48	48	58	60
Width Bucket, Inches..	37	43	46	54	58
Depth Bucket, Inches..	29	30	31	33	33
Coal Capacity, Lbs. ...	900	1050	1350	1800	2100
Weight Each, Lbs.....	462	523	638	779	875
Each	$60.00	70.00	84.00	94.00	103.00

SELF-DUMPING TUBS

STRAIGHT SIDE

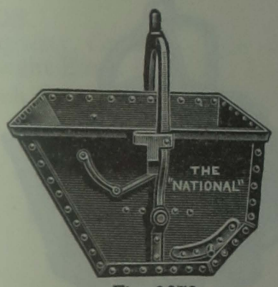


Fig. 3073

Designed to meet the demands for a bucket of less weight and cost than the flaring side; width is equal at both top and bottom; constructed of the best materials; evenly balanced; provided with double bottom; strong bail of drop-forged steel; strong trunnions and reliable latch; corners bound with angle iron securely riveted; top edge bound with iron; when latch is released it dumps automatically, then rights and locks itself.

NOS.	70	71	72	73
Width Bucket, Inches.....	28	31	31½	34
Length Bucket, Inches.....	26	28	29	30
Depth Bucket, Inches.....	15	18	19	19
Capacity, Cubic Feet.....	3	5	6	7
Weight Each, Lbs.....	160	205	210	220
Each	$25.00	27.00	29.00	31.00

NOS.	74	75	76	77
Width Bucket, Inches.....	35	36	38	38
Length Bucket, Inches.....	31	35	38	40
Depth Bucket, Inches.....	19	21	23	25
Capacity, Cubic Feet.....	8	10	12	14
Weight Each, Lbs.....	235	260	330	370
Each	$32.00	36.00	40.00	50.00

NOS.	78	79	80	81	82
Width Bucket, Inches	43	45	47	52	54
Length Bucket, Inches	43	46	50	54	58
Depth Bucket, Inches	27	28	30½	33	36
Capacity, Cubic Feet..	18	21	27	36	41
Weight Each, Lbs.....	465	525	635	775	860
Each	$60.00	70.00	84.00	94.00	103.00

SELF-DUMPING TUBS

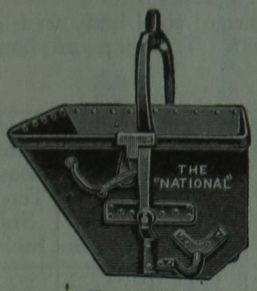


Fig. 3074

FLARING SIDE

Construction and material similar to that of the straight side, but with flaring side; wider at top than at the bottom, so that loose material will free itself readily.

NOS.	83	84	85
Length Bucket, Inches.....	26	29	31
Width Bucket, Inches.....	30	32	34
Depth Bucket, Inches.....	15	18	19
Capacity, Cubic Feet.....	3½	4½	6
Weight Each, Lbs.....	175	205	250
Each	$25.00	28.00	32.00

NOS.	86	87	88	89
Length Bucket, Inches.....	33	36	40	42
Width Bucket, Inches.....	36	41	44	46
Depth Bucket, Inches.....	20	21½	23	25
Capacity, Cubic Feet.....	8	10	12	14
Weight Each, Lbs.....	275	320	390	420
Each	$35.00	40.00	45.00	55.00

NOS.	90	91	92	93
Length Bucket, Inches.....	47	50	58	59
Width Bucket, Inches.....	48	53	65	66
Depth Bucket, Inches.....	28	31	33	34½
Capacity, Cubic Feet.....	21	27	36	42
Weight Each, Lbs.....	560	750	900	1030
Each	$75.00	90.00	110.00	120.00

AUTOMATIC DUMPING TUBS

FOR COAL

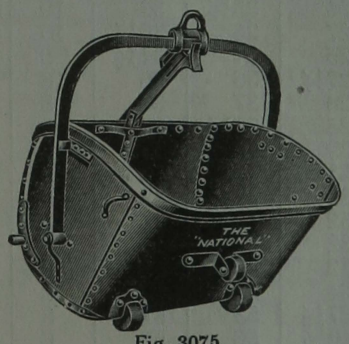


Fig. 3075

Used for automatic coal elevators with inclined booms; back lever catch is extended forward underneath and clear of the bail, to operate as an automatic tripping device; a roller attached to a movable hanger extends downward from the boom; when the extended back lever catch strikes the roller, it is released and bucket automatically drops its load; when empty it rights and locks itself again; bucket constructed of sheet steel; bound strongly with iron on the edges; has strong bail of drop-forged steel.

NOS.	10	11	12	13
Length Bucket, Inches....	34	36	37	40½
Width Bucket, Inches.....	34½	36	38	42
Depth Bucket, Inches.....	23	25	26	29
Coal Capacity, Lbs.....	370	450	560	750
Coal Capacity, Cubic Feet.	7⅔	9	11	15
Weight Each, Lbs.....	250	280	300	410
Each	$32.00	35.00	42.00	65.00

NOS.	14	15	16	17
Length Bucket, Inches....	45	53	56	56
Width Bucket, Inches.....	46	51	57	59
Depth Bucket, Inches.....	30	35	38	38
Coal Capacity, Lbs.....	1120	1500	2000	2240
Coal Capacity, Cubic Feet.	22	30	40	44
Weight Each, Lbs.....	475	645	825	850
Each	$82.00	110.00	125.00	130.00

COAL TUBS

Strongly built to stand hard usage; steel body with generous laps firmly riveted with large head rivets and edge reinforced with a heavy band of iron. Trunnions are hardened steel; bail and catch forged from steel.

Fig. 3076

WITH SIDE CATCH

NOS.	Height From Floor to Mouth of Tub, Inches	Height From Floor to Top of Bail, Inches	Height From Floor to Top of Side, Inches	Length Over All, Inches	Width Over All, Inches	Gauge Steel, Nos.	Capacity Coal, Lbs.	Capacity, Cubic Feet	Wgt. Each, Lbs.	Each
24	17½	34½	22	29	29	10	250	5	155	$30.00
25	18	36	23	31½	32	10	335	7	165	32.50
26	18½	36½	24	33½	33	10	400	8	190	35.00
27	21½	41	27	36	35½	10	500	10	225	40.00
28	20	38	25	34	34½	8	400	8	250	40.00
29	22	41½	27½	36	36	8	500	10	280	44.00
30	22	42	28	37	38	8	560	11	300	45.00
31	22	42	28	37½	39	8	600	12	320	60.00
32	23	43	29	38	39	8	600	12	340	65.00
33	23	46	31	40½	42	8	700	15	410	75.00
34	24	48	31	42½	43	8	800	16	435	80.00
35	24½	48½	32	43	44	8	900	18	445	85.00
36	25	49	32	44	45	8	1000	20	455	88.00
37	25½	49	32	45	46	8	1120	22	475	90.00
38	26½	51	34	51	49	8	1200	24	500	100.00
39	30	60	37½	53	51	8	1500	30	645	130.00
40	32½	64	40½	56	57	6	2000	40	825	140.00
41	32½	64	40½	56	59	6	2240	45	850	150.00

WITH BACK LEVER CATCH

NOS.	Height From Floor to Mouth of Tub, Inches	Height From Floor to Top of Bail, Inches	Height From Floor to Top of Side, Inches	Length Over All, Inches	Width Over All, Inches	Gauge Steel, Nos.	Capacity Coal, Lbs.	Capacity, Cubic Feet	Wgt. Each, Lbs.	Each
42	17½	34½	22	29	29	10	250	5	155	$30.00
43	18	36	23	31½	32	10	335	7	165	32.50
44	18½	36½	24	33½	33	10	400	8	190	35.00
45	21½	41	27	36	35½	10	500	10	225	40.00
46	20	38	25	34	34½	8	400	8	250	40.00
47	22	41½	27½	36	36	8	500	10	280	44.00
48	22	42	28	37	38	8	560	11	300	45.00
49	22	42	28	37½	39	8	600	12	320	60.00
50	23	43	29	38	39	8	600	12	340	65.00
51	23	46	31	40½	42	8	700	15	410	75.00
52	24	48	31	42½	43	8	800	16	435	80.00
53	24½	48½	32	43	44	8	900	18	445	85.00
54	25	49	32	44	45	8	1000	20	455	88.00
55	25½	49	32	45	46	8	1120	22	475	90.00
56	26½	51	34	51	49	8	1200	24	500	100.00
57	30	60	37½	53	51	8	1500	30	645	130.00
58	32½	64	40½	56	57	6	2000	40	825	140.00
59	32½	64	40½	56	59	6	2240	45	850	150.00

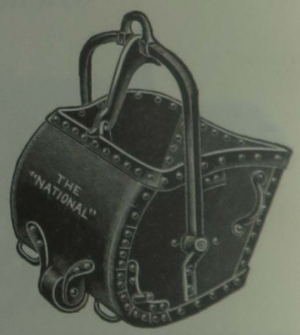


Fig. 3077

MINING BUCKETS

Made of heavy steel plates, re-enforced with an iron band at the top; bail and trunnions of heavy steel; catch is strong, reliable and simple in operation.

Fig. 3078

NOS.	Diameter, Inches	Depth, Inches	Capacity Coal, Lbs.	Capacity, Cubic feet	Weight Each, Lbs.	Each
94	22	28	300	6	152	$17.50
95	25	30	400	8	225	22.00
96	26	32	500	10	262	27.00
97	28½	33	600	12	291	29.00
98	30	35	700	14	335	32.00
99	32	35	800	16	387	37.00
100	34	40	1000	20	524	45.00
101	35	43	1200	24	546	47.00
102	37	48	1500	30	574	53.00

PORTABLE ASPHALT AND TAR FURNACES

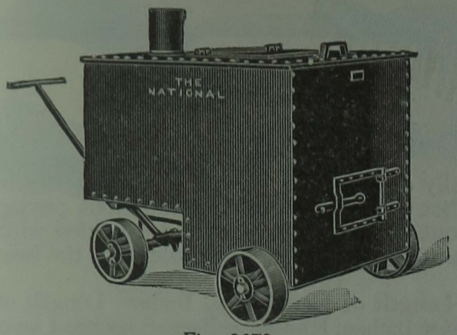


Fig. 3079

Constructed of heavy material throughout; provided with grates for burning either wood or coke, and are with or without ash boxes; the bowl extends the full width, and to within six inches of the length of the body; sides and bottom are made of one piece metal, with a "V" shaped bottom which adds to the strength, increases the heating surface and facilitates the discharge of the contents; wheels are large in diameter, wide on the face and generally re-enforced with wrought iron band; front axle is made of heavy square steel, to which a neatly designed strong fifth wheel is attached. Has long steel draw bar.

NOS.	7	8	9
Capacity, Gallons	50	75	100
Weight each, Lbs	500	800	1100
Each	$100.00	120.00	150.00

NOS.	10	11	12
Capacity, Gallons	125	150	200
Weight Each, Lbs.	1100	1200	1500
Each	$165.00	180.00	220.00

ROUND ASPHALT FURNACES

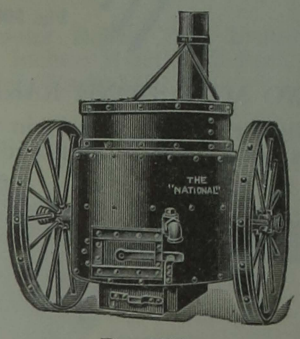


Fig. 3080

Constructed so that it can be easily taken from one job to another; made of extra heavy steel plate; with attached ash pan and check outlet for hot asphalt. Wheels of extra heavy pattern, 42 inches in diameter.

NOS.	13	14	15
Capacity Gallons	50	75	100
Weight Each, Lbs	525	825	1100
Each	$125.00	150.00	175.00

NOS.	16	17
Capacity, Gallons	150	200
Weight Each, Lbs	1250	1600
Each	$220.00	275.00

EXTENSIBLE TRENCH BRACES

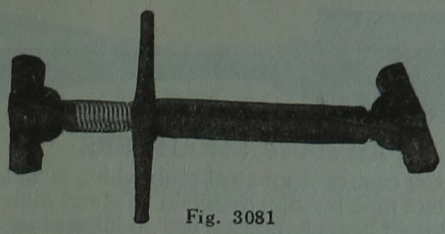


Fig. 3081

Light and strong and easily adapted to any width of ditch by merely changing the tubing, which is standard gas pipe. The screws have double threads, giving quick travel to the lever nut. Extensible to about one-half the length of the screw.

Diam. Screw, Inches	Length Screw, Inches	Length of Brace Closed, Inches	Weight, Per Doz. Pounds	Per Doz.
1½	11	16	200	$23.00
1½	12	18	210	23.00
1½	14	21	222	24.00
1½	14	24	234	24.00
1½	16	27	246	26.00
1½	16	30	256	26.00
1½	18	36	280	27.00
1½	18	42	312	28.00
1½	18	48	325	29.00
2	18	36	542	51.00
2	18	42	564	52.00
2	18	48	586	53.00
2	18	54	608	54.00
2	18	60	630	55.00

TRENCH BRACE FITTINGS

Fittings for above trench braces can be furnished without tubing to contractors who wish to put on pipe to suit themselves. Ordinary gas pipe is all that is required for the barrel. Can be used either in connection with pipe or with washer plates on timber braces. Extensible to about one-half the length of the screw.

Size of Screw, Inches	Length Screw, Inches	Weight Per Dozen, Pounds	Per Dozen, Complete	Per Dozen, Screw Ends Only
1½	12	185	$20.00	$15.00
1½	14	192	21.00	16.00
1½	16	204	22.00	17.00
1½	18	208	23.00	18.00
2	18	440	45.00	33.00

SCREW FITTINGS FOR TIMBER TRENCH BRACES

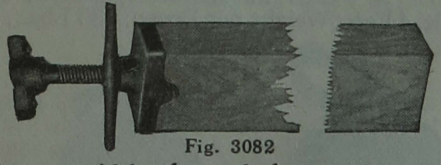


Fig. 3082

Used in any width of trench from two to thirty feet. It will be found especially valuable in wide deep trench work; also used to good advantage in vertical bracing. When required, caps can be furnished for the butt end of the brace. Timbers are not furnished. Extensible to about one-half the length of the screw.

Size Screw, Inches	Size Cap, Inches	Weight, Per Doz., Pounds	Per Doz.	Butt Caps Per Doz.
1½x14	4 x4	175	$18.00	$ 3.00
1½x14	6x 6	192	20.00	4.00
1½x18	6x 6	214	22.00	4.00
2 x18	6x 6	384	38.00	5.00
2 x18	8x 8	410	40.00	7.00
2 x18	10x10	450	42.00	10.00
2 x18	9x12	444	44.00	11.00

PAVING IMPLEMENTS

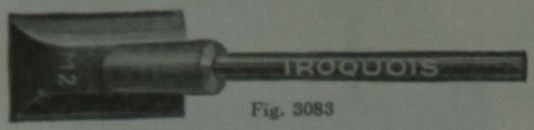


Fig. 3083

ASPHALT SMOOTHERS

The foot is cast on to a steel stub which is welded to a 1¼-inch steel pipe handle; designed to stand high temperatures and hold heat; handles 5 feet, 6 inches long.

Size Base, Inches	14½x7½	10½x6½
Weight Each, Lbs.	67	46
Weight Each, Lbs.	67	46
Each	$....	....

Price on Application

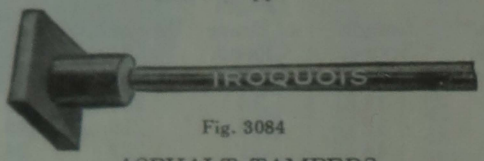


Fig. 3084

ASPHALT TAMPERS

Designed to stand high asphalt temperatures and hold heat; foot is cast on to a steel stub which is welded to a 1¼-inch steel pipe; handles, 4 feet, 6 inches long.

Size Base, Inches	8x6	8x8	6x6	5½x2½
Weight Each, Lbs.	35	37	29	16
Each	$....	....	....	....

Price on Application

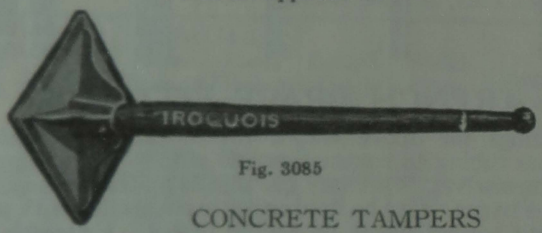


Fig. 3085

CONCRETE TAMPERS

Square cast iron foot, ground smooth on face; foot is rigidly secured by a screw to a hardwood handle.

Each

NO. 1—Foot, 8x8 Inches; 4-Foot Handle; Weight Each, 14½ Lbs. ..... $.....

Price on Application

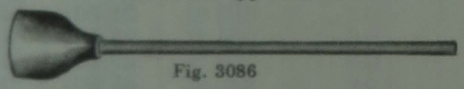


Fig. 3086

CEMENT AND SOD TAMPERS

Round cast iron foot, ground smooth on face; foot is secured to an iron pipe handle.

Per Dozen

NO. 2—Foot 5 inches in Diameter; Length of Handle, 4 Feet; Weight per Dozen, 180 Lbs.... $7.60

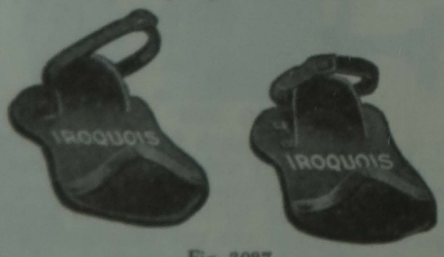


Fig. 3087

ASPHALT SANDALS

For protection against hot asphalt surfaces and to prevent tracking of the soft pavement with workmen's shoes; made of double ply, extra heavy, canvas soaked in mud red paint; metal heels riveted to the sole; straps of best quality leather with buckles.

Per Pair

NO. 0—14 Inches Long; 7 Inches Wide; ½ Inch Thick; Weight per Pair, 3½ Lbs. ..... $.....

Price on Application

PAVING IMPLEMENTS

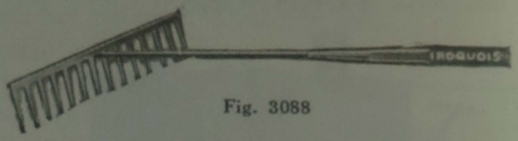


Fig. 3088

ASPHALT RAKE

Especially designed for the severe service required of a rake for hot asphalt and other bituminous paving work; stamped out of solid steel plate and provided with a long steel shank to protect wooden handle from the heat.

Each

NO. 10—Length of Head, 15½ Inches; Length of Tines, 4 Inches; Handle, 6 Feet, 6 Inches Long; Weight Each, 5 Lbs. ..... $.....

Price on Application

Fig. 3089

ROAD RAKE

Made of extra heavy steel, teeth black finished; hardwood handle; steel ferrule.

NOS.	14	16
Number of Teeth	14	16
Length of Handle, Feet	6	6
Weight Each, Lbs.	55	60
Each	$23.30	24.70

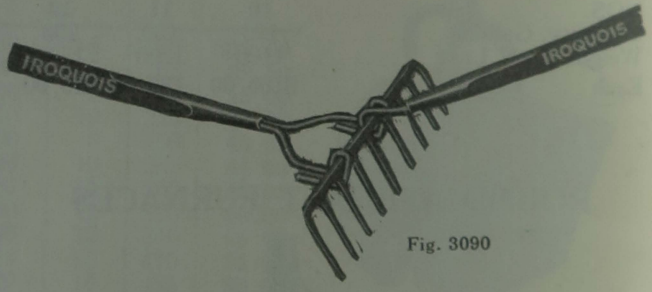


Fig. 3090

TWO MAN STONE RAKE

Made especially for spreading stones in the building of roads and streets; constructed to withstand severe service; strap ferrules.

Each

NO. 5—Nine Teeth; 6 Inches Long; Handle, 6 Feet Long; Weight Each, 10 Lbs. ..... $.....

Price on Application

Fig. 3091

ASPHALT CUTTERS

Used for cutting out old asphalt pavements; made of tool steel with tempered cutting edges; pick handles are used with these cutters, but are not supplied with them unless so ordered.

Each

NO. 200—Length Between Edges, 20½ Inches; Width of Edge, 3 Inches; Weight Each, 10 Lbs. $.....

Price on Application

PAVING IMPLEMENTS

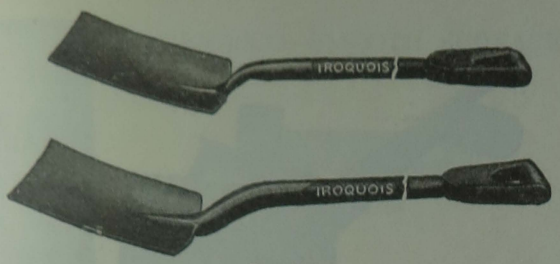


Fig. 3092

ASPHALT SHOVELS

Designed with flat, square pointed bowl for asphalt work; furnished with either open strap or solid steel socket. The solid socket keeps the handle from burning and is recommended; hardwood, D shaped handles.

Each

NO. 300—Length of Bowl, 12 Inches; Width of Bowl, 9½ Inches; Weight Each, 5¾ Lbs.....$.....

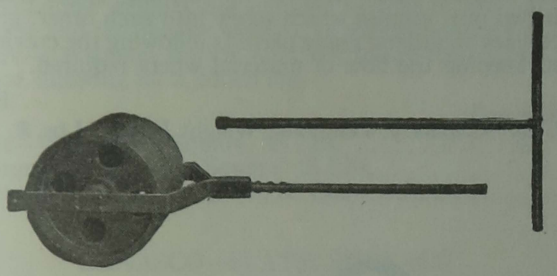


Fig. 3093

HAND ROLLERS

For asphalt patching, first compression on bituminous pavements, or any rolling service requiring a high-grade hand roller; made of gray iron with face turned smooth and true; rolls are mounted in a bar steel frame on a steel axle with long journals with provisions for oiling; handle of 1¼ inch pipe, in two sections, fastened securely to frame with bolts.

Each

NO. XX—Diameter Roller, 29⅝ Inches; Length Roller, 19 Inches; Handle, 13 Feet, 7 Inches Long; Weight Each, 1150 Lbs.....$.....

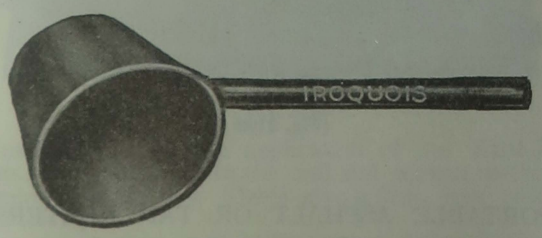


Fig. 3094

ASPHALT AND TAR DIPPERS

A substantial dipper for hard service; for paving and roofing contractors; made of No. 24 galvanized iron with a heavy wire band around the top edge; base of ferrule is securely riveted to the dipper; length of handle, eight feet.

Each

NO. 6—Capacity, 6 Quarts; Weight Each, 7 Lbs...$.....

NO. 9—Capacity, 9 Quarts; Weight Each, 9 Lbs.....

Prices for the above items will be quoted on application.

PAVING IMPLEMENTS

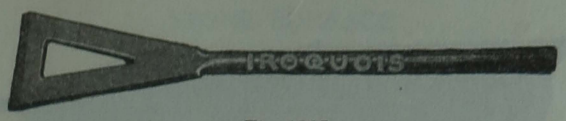


Fig. 3095

STIRRING RODS

Used for hand stirring in the preparation of asphalt mixtures in asphalt repair wagons, old material pans and mastic pots; handle of 1½ inch iron pipe, welded at the bottom to a triangular steel spud.

Each

NO. 304—Spud 10 Inches High by 7 Inches Wide; Handle, 4 Feet 6 Inches Long; Weight Each, 13½ Lbs.....$.....

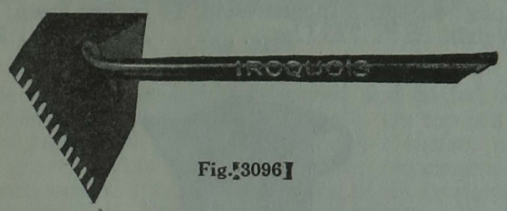


Fig. 3096

ASPHALT PATCHING HOES

Used for scraping off the old surface, while it is hot, after surface heater has been applied, when patching or resurfacing asphalt pavements; steel blade; stamped teeth; steel pipe handle welded to a steel crow foot strongly bolted to the head.

Each

NO. 100—Blade, 10 Inches Wide, 8 Inches High; Teeth, 1 Inch Pitch, 1 Inch Deep; Handle, 7 Feet, 10 Inches Long, ¾ Inches in Diameter; Weight Each, 11 Lbs.....$.....

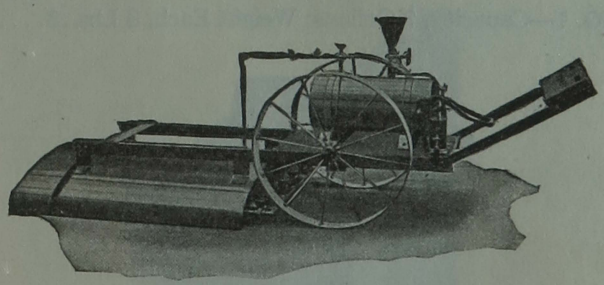


Fig. 3097

SURFACE HEATERS

Designed for heating old asphalt pavements, to soften the surface when patching or resurfacing a street and many other kinds of surface heating and drying purposes where a portable heater is adapted to the work; hoods of heavy sheet steel; burns either gasoline, kerosene or a mixture of both; frame of 3-inch channels supported by a steel axle; fuel tank of galvanized iron, with a hand air pump, pressure gauge, valves and funnel.

Diameter Wheels, Inches	**36**	**36**	**36**	**36**
Face Wheels, Inches	4	4	4	4
Capacity Tank, Gallons	17½	17½	17½	17½
Width Hood, Feet	1	2	3	4
Length Hood, Feet	4	4	4	5
Burners	2	3	4	5
Weight Each, Lbs.	615	615	615	615
Each...$	....	....	....	....

Prices for the above items will be quoted on application.

PAVING IMPLEMENTS

Fig. 3098

OLD MATERIAL PANS

Used for reheating of old asphalt removed from the street for patch work; made of ¼-inch sheet steel with bottom of one piece, rolled to shape and riveted to flanged heads; angles are riveted across edge end and the side edges are flanged over three inches for supporting it on brick walls.

Each

NO. 6—Inside Dimensions: 9 Feet, 11½ Inches Long; 4 Feet, 2 Inches Wide; 14 Inches Deep; Weight Each, 725 Lbs. ..... $.....

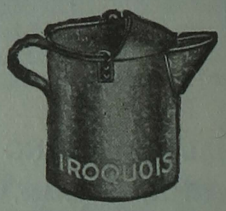


Fig. 3099

ASPHALT MELTING POTS

Used for heating small quantities of asphalt cement over the fire wagon; for painting joints in patch work or for carrying asphalt from the melting kettle to the men using the pouring pots; made of No. 24 galvanized iron, all edges and joints rolled over heavy wire with no soldered seams.

Each

NO. 7—Capacity, 7 Gallons; Weight Each, 8 Lbs. . $.....

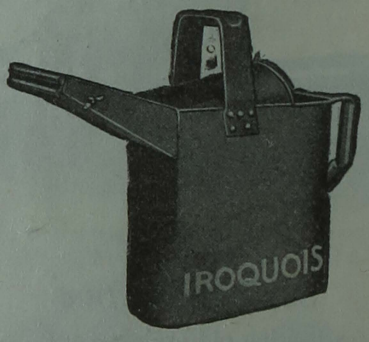


Fig. 3100

POURING POTS

Used for hand pouring of asphalts, oils and tar in penetration road construction, also adapted for spreading roof pitch and waterproofing concrete work; made of heavy sheet iron; oxy-acetylene-welded seams; spreader is made in two widths, 8 and 10 inches, and can be adjusted by two thumb screws, allowing a specified amount of material to be poured per square yard; hood prevents slopping and protects the operator; a basket screen fits into top for straining the material when pot is filled.

Each

NO. 4—Capacity, 4 Gallons; Weight Each, 7 Lbs. . $.....

Note.—8-Inch spouts are furnished unless otherwise specified.

Prices for the above items will be quoted on application.

PAVING IMPLEMENTS

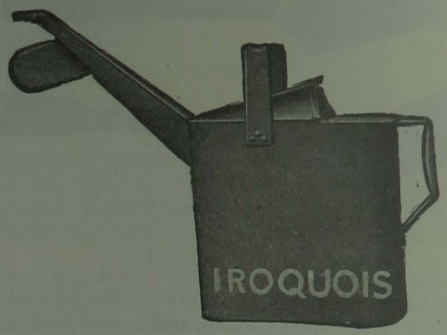


Fig. 3101

BRICK FILLING POTS

Oxy-acetylene welded and made of heavy sheet iron; provided with hood to prevent slopping, and a fine wire screen which is easily removed for cleaning; spout is fitted with two pipe nipples which screw into each other, giving three sizes of outlets; guide permits following the crevice or joint, keeping the flow of material where required.

Each

NO. 4A—Capacity, 4 Gallons; Weight Each, 7 Lbs. $.....

[Fig. 3102

PORTABLE ASPHALT OR TAR HEATERS

Portable, for heating small quantities of asphalt cement or tar for the road patrol; also for street repair gang to paint cuts and joints when repairing asphalt pavements; constructed of 3/16-inch steel plates closely riveted; equipped with grate for burning wood or coal; pot made of No. 20 black iron.

Each

NO. XXX—Diameter Furnace, 16½ Inches; Height from Ground, 16¾ Inches; Wheel, 16 Inches in Diameter; Diameter Pot, 14 Inches; Height, 15 Inches; Capacity, 10 Gallons; Weight Each, 136 Lbs. ..... $.....

Prices for the above items will be quoted on application.

READY ROOFING

GENASCO—SMOOTH SURFACE

Fig. 3103

Fig. 3104

A slate-color, rubber-like, tough material alike on both sides. It is made from densely compressed long-fibre felt saturated with natural asphalt, having a layer of the natural asphalt on both surfaces. This makes a lasting waterproof roofing which does not dry out, crack, or become brittle and break. Made in three weights: light, medium and heavy. For ordinary purposes, medium is generally used. The heavy roofing is best adapted for large roofs exposed to unusual weather conditions.

The lighter weights are supplied in rolls of one or two squares, and the heavier weights, in rolls of one square. One square (108 square feet) is sufficient to lay 100 square feet of roof, allowing for a 2-inch lap.

Per Square

Light—Weight Per Square, 35 Lbs. .....$.....
Medium—Weight Per Square, 45 Lbs. ....
Heavy—Weight Per Square, 55 Lbs. ....

GENASCO—SLATE SURFACE

Composed of felt, thoroughly saturated and coated on the underside with Trinidad Lake Asphalt. On top is a thick layer of asphalt, in which is embedded, while hot, a surface of red or green crushed slate. The slate is natural color, therefore permanent. This type of roofing is exceptionally attractive, durable and fire-resisting.

Light—Weight Per Square, 85 Lbs. .....$.....
Medium—Weight Per Square 90 Lbs. .....
Heavy—Weight Per Square 95 Lbs. .....

KANT-LEAK KLEETS

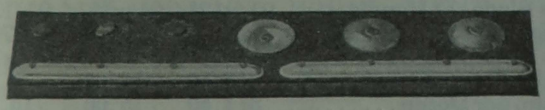


Fig. 3105

Illustration shows the application of the Kant-Leak Kleets in comparison with the nail and cement method of fastening roofing. The Kleets give a firm, even pressure along the laps.

Completely does away with cement, large-head nails, and caps; makes seams absolutely watertight, prevents bulging, and makes leaks impossible from nails driven in cracks; gives a firm, even pressure that makes the roof positively wind-proof, buckle-proof, and proof against rain, smoke or fumes driving their way to the under surface of the roofing. It gives a fine appearance to ready roofing that was heretofore impossible.

A special fireproofing value of the Kant-Leak Kleet lies in its continuous pressure at laps and joints, preventing the draft of air that is often fatal in time of fire. There is no cement to liquefy from heat, allowing seams to open.

Packed in every roll of smooth surface and slate surface ready roofings.

Price on Application.

READY ROOFING

STONE SURFACE

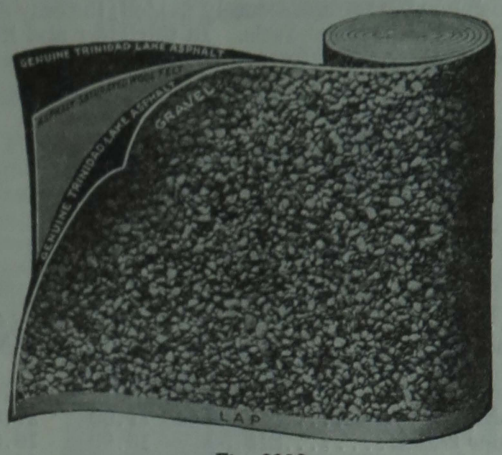


Fig. 3106

Made of felt, thoroughly saturated and coated on the under side with Trinidad Lake Asphalt. On top is a thick layer of asphalt in which is embedded a surface of sea-beach gravel. This type is specially recommended in neighborhoods of fire hazard because of its excellent fireproofing qualities. Sparks or burning embers falling on it will burn out without igniting the roof.

Put up in rolls containing 112 square feet, sufficient to cover 100 square feet of roof, allowing for 3-inch marginal lap.

Directions for laying, large-head galvanized nails, and liquid cement are packed inside each roll.

Per Square

Weight Per Square, 120 Lbs. .....$.....

ASPHALT SHINGLES

SEAL BAC

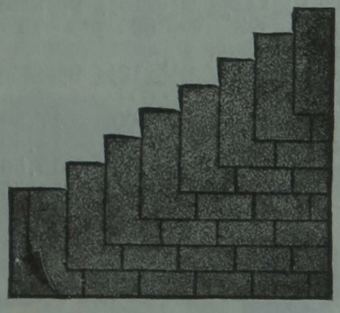


Fig. 3107

For homes and all buildings where roofing might be less desirable in rolls, Asphalt Shingles are provided. Manufactured in soft, mellow red and green, they lend themselves harmoniously to any style of building—imposing residence, garage, stable, bungalow, church, station, and any public building of dignity and beauty. Will stand continued heavy rains, and temperature extremes without warping, splitting or drying up. Asphalted on both sides and will not curl.

Per Square

Red or Green—Size, 8x12¾ Inches; 4 Packages, Per Square; Weight Per Square, 220 Lbs. .....$.....

Red or Green—Size, 10x32⅛ Inches; 2 Packages, Per Square; Weight Per Square, 190 Lbs. ....

Note.—A square is sufficient roofing to cover 100 square feet of roof with allowance made for laps.

Price on Application.

SHOVELS

Fairbanks and Chain shovels, made with high carbon open hearth steel blades; fitted with straight grained, second-growth ash handles; straps securely welded; the only difference between the two being the better appearance, balance and finish of the Fairbanks shovels. In the Tiger and Elm shovels, blades are made of bessemer steel, fitted with selected ash handles; the only difference between the two being that the Tiger shovels have a heavier blade.

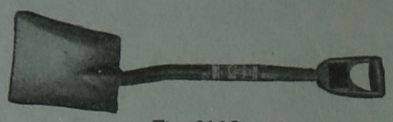


Fig. 3108

Plain back, square point; D or long handle.

NOS.	2	3	4
Size Blade, Inches	9½x11¾	9¾x12¼	10½x12½
Weight per Dozen, D Handle, Lbs.	62	66	70
Fairbanks, per Dozen	$16.50	17.00	17.50
Chain, per Dozen	$15.50	16.00	16.50
Tiger, per Dozen	$14.50	15.00	15.50
Elm, per Dozen	$13.50	14.00	14.50

NOS.	5	6	7	8
Size Blade, Ins.	10⅞x13	11¼x13½	11¾x14	12¼x14¾
Weight per Dozen D Handles, lbs.	74	77	80	82
Fairbanks,per doz.	$18.00	18.50	19.00	19.50
Chain, per Doz.	$17.00	17.50	18.00	18.50

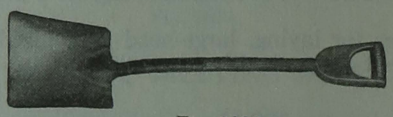


Fig. 3109

Plain back, round point; D or long handle.

NOS.	2	3	4	5
Size Blade, D Handle, Inches	9¼x12¾	9½x13¼	9¾x13¾	10½x14¼
Wt. per Doz. Lbs.	64	68	72	75
Size Blade, Long Handle, Inches	9¼x11¾	9½x12¼	9¾x12¾	10¼x13¼
Wt. per Doz. lbs.	60	60	66	68
Fairbanks,per doz.	$16.50	17.00	17.50	18.00
Chain, per Doz.	$15.50	16.00	16.50	17.00
Tiger, per Doz.	$14.50	15.00	15.50	16.00
Elm, per Doz.	$13.50	14.00	14.50	15.00

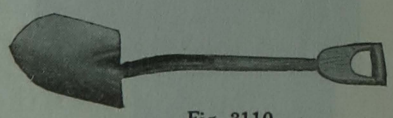


Fig. 3110

Back strap; square or round point; D or long handle.

NOS.	2	3	4	5	6
Size, Blade, Inches	9½x11¾	9¾x12¼	10½x12½	10⅞x13	11¼x13½
Weight per Dozen D Handle, Lbs.	65	69	72	75	78
Fairbanks, per Dozen	$15.50	16.00	16.50	17.00	17.50
Chain, per Dozen	$14.50	15.00	15.50	.....	16.50
Tiger, per Dozen	$13.50	14.00	14.50	.....	.....
Elm, per Dozen	$12.50	13.00	13.50	.....	.....

Note.—Plain back D-handle shovels furnished unless otherwise ordered. Fairbanks and Elm are most popular brands.

Fig. 3111

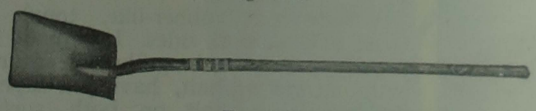


Fig. 3112

Hollow back, square point; D or long handle.

NOS.	2	3	4
Size Blade, Inches	9½x11¾	9¾x12¼	10½x12½
Wt. per Doz. D Handle,Lbs.	72	74	77
Fairbanks, per Doz.	$15.50	16.00	16.50
Chain, per Doz.	$14.50	15.00	15.50
Tiger, per Doz.	$13.50	14.00	14.50
Elm, per Doz.	$12.50	13.00	13.50

NOS.	5	6	7	8
Size Blade, Ins.	10⅞x13	11¼x13½	11¾x14	12¼x14¾
Weight per Doz., D Handle, Lbs.	80	84	82	84
Fairbanks,per Doz.	$17.00	17.50	18.00	18.50
Chain, per Doz.	$16.00	16.50	17.00	17.50
Tiger, per Doz.	$15.00	15.50	16.00	16.50
Elm, per Doz.	$14.00	14.50	15.00	15.50

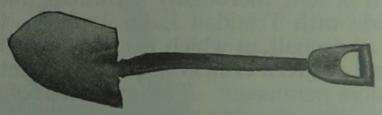


Fig 3113

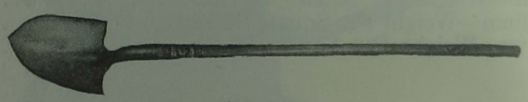


Fig. 3114

Hollow back, round point; D or long handle.

NOS.	2	3	4
Size Blade, D Handle,	9¼x12¾	9½x13¼	9¾13¾
Weight per Dozen, Lbs.	70	73	70
Size Blade,Long Handle, Ins.	9¼x11¾	9½x12¼	9¾x12¾
Fairbanks, per Dozen	$15.50	16.00	16.50
Chain, per Dozen	$14.50	15.00	15.50
Tiger, per Dozen	$13.50	14.00	14.50
Elm, per Dozen	$12.50	13.00	13.50

NOS.	5	6	7	8
Size Blade, D Handle, Ins.	10⅛x14¼	10½x14¾	11x15¼	11½x15¾
Wt. per Doz.lbs.	72	74	76	77
Size Blade, Long Handle, Ins.	10¼x13¼	.....	.....	.....
Fairbanks, per doz.	$17.00	17.50	18.00	18.50
Chain, per Doz.	$16.00	16.50	17.00	17.50
Tiger, per Doz.	$15.00	15.50	16.00	16.50
Elm, per Doz.	$14.00	14.50	15.00	15.50

Note.—Round point D handle made in all sizes; round point, long handle, made in sizes Nos. 2 to 5 only.

Plain back D-handle shovels furnished unless otherwise ordered. Fairbanks and Elm are our most popular brands.

Price for Black and Half-Polished on Application

SHOVELS

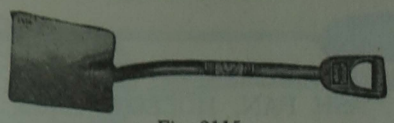


Fig. 3115

MOULDERS

Plain back; Solid D, or Split "D" handles; polished.

NO.	2
Size Blade, Inches	9¾x12
Weight per Dozen, Lbs.	60
Fairbanks, per Dozen	**$16.50**
Chain, per Dozen	**15.50**
Tiger, per Dozen	**14.50**
Elm, per Dozen	**13.50**

"Elm" has narrow strap, others socket strap.

Fairbanks and Elm D handle polished shovels are the most popular brands.

Price for black and half polished blades on application.

Fig. 3116

PLAIN BACK-SQUARE POINT

Made of the best crucible steel; "D" handles; polished.

NOS.	2	3	4	5	6
Size Blade, Ins.	9¾x12	9⅞x12¼	11x13⅛	11⅜x13¾	11¾x14⅛
Length, Ins.	37	37½	38½	39½	40
Wgt. per Doz., Lbs.	59	61	68	70	74
Per Dozen	**$24.00**	**25.00**	**26.00**	**27.00**	**28.00**

Fig. 3117

PLAIN BACK, ROUND POINT

Made of the best crucible steel. "D" handles, polished.

NOS.	2	3	4	5
Size Blade, Ins.	9½x13	9½x13¼	10⅛x13⅞	10⅜x14¾
Length Over All, Inches	38	38¼	38¾	39¾
Weight per Dozen, Lbs.	58	59	66	68
Per Dozen	**$24.00**	**25.00**	**26.00**	**27.00**

Price of Black and Half Polished on Application

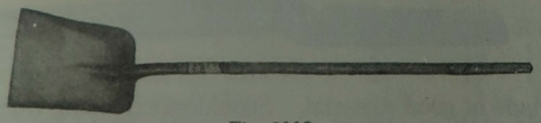


Fig. 3118

SNOW SHOVELS

Hollow back, long handle.

NO.	001
Size Blade, Inches	11½x14
Length Over All, Inches	60½
Weight per Dozen, Lbs.	66
Per Dozen	**Price on Application**

All of Above Packed Six in a Bundle

SPADES

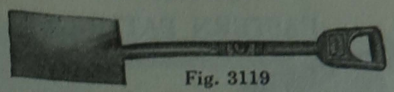


Fig. 3119

PLAIN BACK—SOCKET STRAP

Polished, with "D" or long handles.

NO.	2
Size Blade, Inches	7¼x12
Weight per Dozen, Lbs.	64
Fairbanks, per Dozen	**$16.50**
Chain, per Dozen	**15.50**
Tiger, per Dozen	**14.50**
Elm, per Dozen	**13.50**

Elm has narrow strap; others, socket strap. Fairbanks and Elm, "D" handle, polished, are the most popular brands.

COAL SCOOPS

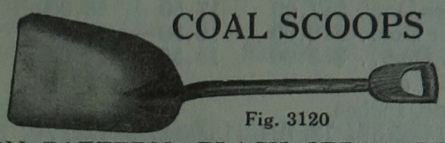


Fig. 3120

EASTERN PATTERN BLACK STRAP, RIVETED

"D" handles—polished blades.

NOS.	2	3	4	5
Size Blade, Ins.	11¼x11½	11½x15	11¾x15⅜	12⅜x16
Wgt. per Doz. Lbs.	74	78	82	86
Fairbanks, per Doz.	**$20.00**	**20.50**	**21.00**	**21.50**
Chain, per Doz.	**$19.00**	**19.50**	**20.00**	**20.50**
Tiger, per Doz.	**$18.00**	**18.50**	**19.00**	**19.50**
Elm, per Doz.	**$17.00**	**17.50**	**18.00**	**18.50**

NOS.	6	7	8	9
Size Blade, Ins.	13¼x16½	13⅜x17	13¾x17½	14x17¾
Wgt. per Doz. Lbs.	90	94	98	92
Fairbanks, per Doz.	**$22.00**	**22.50**	**23.00**	**23.50**
Chain, per Doz	**$21.00**	**21.50**	**22.00**	**22.50**
Tiger, per Doz.	**$20.00**	**20.30**	**21.00**	**21.50**
Elm, per Doz	**$19.00**	**19.50**	**20.00**	**20.50**

Ash pan scoops with 4½ foot handle furnished at above list.

Locomotive scoops with 22 to 27-inch handles take the above list.

Black, diamond or round point breaking down scoops take the above list.

Fairbanks and Elm polished, "D" handle coal scoops and block "D" handle breaking down scoops are the most popular brands.

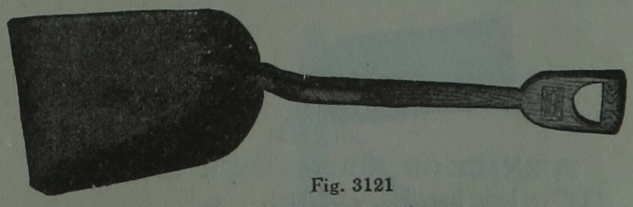


Fig. 3121

O. AMES & SANDERSON

Back Strap; Ames Crucible steel; Sanderson cast steel; "D" handles; polished.

NOS.	2	3	4	5	6
Size Blade, Inches	11x14⅞	11⅝x15¼	12¼x15¾	12½x16⅜	12⅝x16¾
Weight per Dozen, Lbs.	79	79	82	85	88
Ames, per Dozen	**$26.00**	**27.00**	**28.00**	**29.00**	**30.00**
Sanderson, per Dozen	**$20.75**	**21.75**	**22.75**	**23.75**	**24.75**

NOS.	7	8	9	10	12
Size Blade, Inches	13¾x16⅞	14x17½	14¾x17¾	15x18¾	15½x19¼
Weight per Dozen, Lbs.	90	91	93	95	102
Ames, per Dozen	**$31.00**	**32.00**	**33.00**	**34.00**	**36.00**
Sanderson, per Dozen	**$25.75**	**26.75**	**27.75**	**28.75**	**30.75**

Ames Black, breaking down scoops take same list. Price of black and half polished on application unless otherwise stated. **All of Above, Packed Six in a Bundle.**

SCOOPS

EASTERN PATTERN

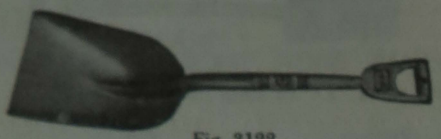


Fig. 3122

HOLLOW BACK

Coal, "D" or long handles, polished.

NOS.	2	3	4	5
Size Blade, Ins.	10½x15¼	11x15½	11¼x15¾	11½x16¼
Wt. per doz., lbs.	74	76	80	83
Fairbanks, per Dozen	$18.00	18.50	19.00	19.50
Chain, per Doz.,	$17.00	17.50	18.00	18.50
Tiger, per Doz.	$16.00	16.50	17.00	17.50
Elm, per Doz.	$15.00	15.50	16.00	16.50

NOS.	6	7	8	9	10
Size Blade, Inches	11¾x16¾	13x16¾	13½x17¼	14x17¾	14x17¾
Weight per Doz., Lbs.	90	94	97	98	96
Fairbanks, per Doz.	$20.00	20.50	21.00	21.50	22.00
Chain, per Doz.	$19.00	19.50	20.00	20.50	21.00
Tiger, per Doz.	$18.00	18.50	19.00	19.50	20.00
Elm, per Doz.	$17.00	17.50	18.00	18.50	19.00

Furnished regularly with 27-inch handles. Can be furnished with 22, 24 or 54-inch handles at the same list.

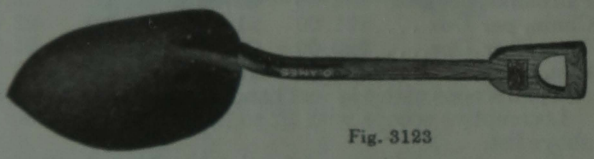


Fig. 3123

BREAKING DOWN OR DIAMOND POINT, BACK STRAP

Made in black only. Take the same list as regular polished coal scoops.

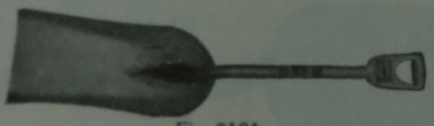


Fig. 3124

FURNACE OR HOUSE—BACK STRAP

"D" or long handles. Polished.

NOS.	000	001	002
Width Blade, Inches	8	8½	9
Length Blade, Inches	12	13	14
Weight per Dozen, Lbs.	58	62	65
Elm, per Dozen	$8.00	8.00	8.00

"D" handles furnished unless otherwise ordered.

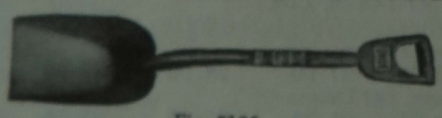


Fig. 3125

FIRING SCOOPS, HOLLOW BACK

"D" or long handles. Polished.

NO.	00
Width Blade, Inches	10½
Length Blade, Inches	23
Weight per Dozen, Lbs.	99
Fairbanks, per Dozen	$24.75

Price for black and half polished scoops on application, unless otherwise stated.

All Above Packed Six in a Bundle

SCOOPS

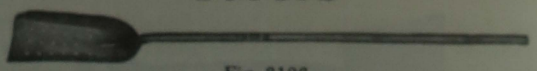


Fig. 3126

ASH PAN, HOLLOW BACK

With perforated blade and 6 foot handle. Polished.

NO.	06
Width Blade, Inches	9½
Length Blade, Inches	22
Weight per Dozen, Lbs.	120
Fairbanks, per Dozen	$24.75

Add $1.00 per foot net for handles up to 10 feet. Price of black and half polished on application.

TELEGRAPH SHOVELS

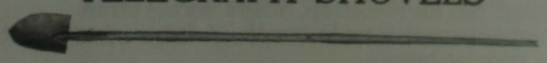


Fig. 3127

Furnished in black finish only.

Length Handle, Feet	4½	5	6
Size Blade, Inches	9¼x11¾	9¼x11¾	9¼x11¾
Length Strap, Inches	9	9	9
Weight per Dozen, Lbs.	64	67	68
Fairbanks, per Dozen	$16.50	18.00	18.50

Length Handle, Feet	7	8	9	10
Size Blade, Ins.	9¼x11¾	9¼x11¾	9¼x11¾	9¼x11¾
Length Strap, Ins.	9	9	9	9
Wt. per Doz., Lbs.	70	72	74	76
Fairbanks, per Doz.	$19.50	20.50	21.50	22.50

For 18-inch straps, add $1.50 net per dozen. For each additional 6 inches, add $0.25 per dozen net.

TELEGRAPH SPOONS

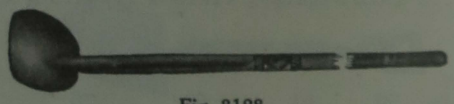


Fig. 3128

Furnished in black finish only.

Length Handle, Feet	4½	5	6
Length Strap, Inches	9	9	9
Weight per Dozen, Lbs.	64	67	68
Fairbanks, per Dozen	$16.50	18.50	19.00

Length Handle, Feet	7	8	9	10
Length Strap, Inches	9	9	9	9
Weight per Dozen, Lbs.	70	72	74	76
Fairbanks, per Dozen	$20.00	21.00	22.00	23.00

For extra length straps, add the same net to price as for telegraph shovels with long straps.

All Above Packed Six in a Bundle

POST HOLE DIGGERS

PERFECTION

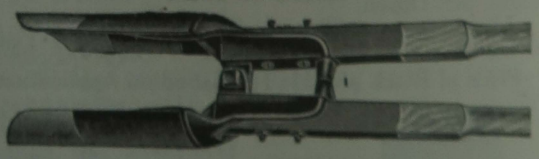


Fig. 3129

Made of good material. Shoulders extending from the upper part of sockets are provided with mortises and tenons which interlock. Prevents side motion and protects operators' fingers from being pinched.

NO.	1
Length Handle, Feet	4
Weight per Dozen, Lbs.	116
Per Dozen	$18.00

Can also be furnished with 7-foot handles.

Packed Three in a Bundle

FORKS

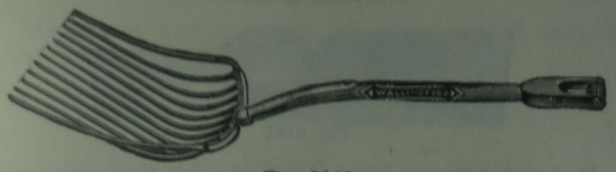


Fig. 3130

COTTON SEED

Diamond tines; malleable or wood "D" handles; strap ferrules.

NOS.	410	412	414
Number of Tines	10	12	14
Width Fork at Center, Inches	14	18	18
Length Tines, Inches	17	17	17
Space Between Tines, Inches	1¼	1¼	1
Weight per Dozen, Lbs.	90	100	110
Per Dozen	**$24.00**	**28.00**	**33.00**

SCOOP FORKS

These forks have scoop shaped tines.

NOS.	410S	412S	414S
Number of Tines	10	12	14
Width Fork at Center, Inches	14	18	18
Length Tines, Inches	17	17	17
Space Between Tines, Inches	1¼	1¼	1
Weight per Dozen, Lbs.	90	100	110
Per Dozen	**$24.00**	**28.00**	**33.00**

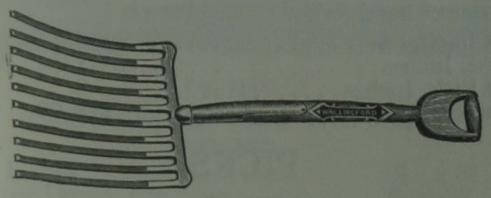


Fig. 3131

STONE OR BALLAST

Forged from one solid piece of steel; selected ash wood "D" handle; blue finish; square tines.

NOS.	B8	B110	B112
Number of Tines	8	10	12
Length Tines, Inches	13½	14	14
Space Between Tines, Inches	1⅛	1	1
Weight per Dozen, Lbs.	80	90	100
Per Dozen	**$20.00**	**25.00**	**29.00**

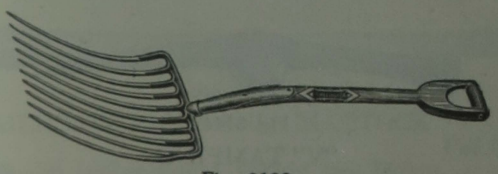


Fig. 3132

Diamond Tines, malleable or wood "D" handles. Strap ferrules.

Forged from one-piece of solid steel selected ash wood "D" handle; blue finish; black diamond shaped tines.

COKE

NOS.	K10	K12	K14
Number of Tines	10	12	14
Length of Tines, Inches	17	17	17
Space Between Tines, Inches	1¼	1¼	1¼
Weight per Dozen, Lbs.	90	100	110
Per Dozen	**$24.00**	**28.00**	**33.00**

COAL

NOS.	1078	1278	1434
Number of Tines	10	12	14
Length of Tines, Inches	16	16	16
Spaces Between Tines, Inches	⅞	⅞	¾
Weight per Dozen, Lbs.	90	100	100
Per Dozen	**$25.00**	**29.00**	**33.00**

MORTAR HOES

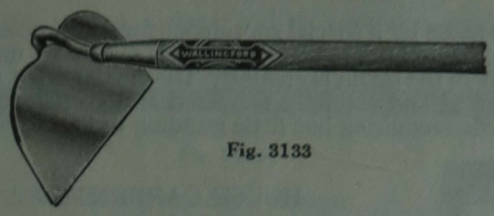


Fig. 3133

Forged from best crucible steel; handles of white ash; bronze finish.

NOS.	9	S9	10	S10
Type	Shank	Socket	Shank	Socket
Width Blade, Inches	9	9	10	10
Length Handles, Feet	5½	5½	6	6
Weight per Dozen, Lbs.	45	40	50	45
Per Dozen	**$23.50**	**26.00**	**25.40**	**27.90**

SIDEWALK CLEANERS

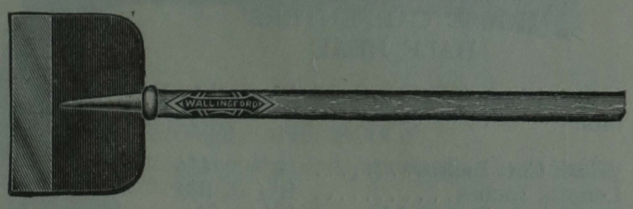


Fig. 3134

Made of solid cast steel; heavy shanks; painted blue.

NOS.	SCx7½	SCx8
Width Blade, Inches	7½	8
Depth Blade, Inches	6	6
Length Handle, Inches	4½	4½
Weight per Dozen, Lbs.	45	50
Per Dozen	**$10.20**	**10.60**

ASPHALT STREET CLEANING SCRAPERS

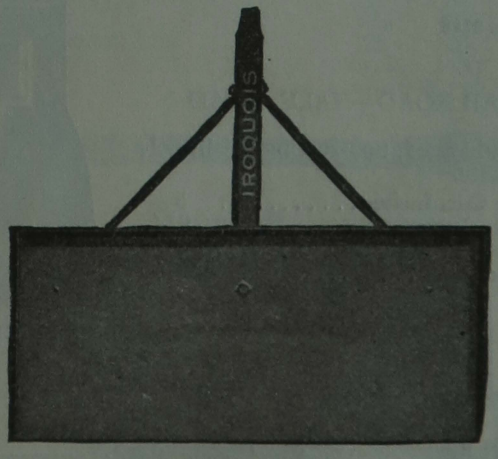


Fig. 3135

Constructed of No. 18 sheet steel; wears off to a sharp edge which does not curl up as on most scrapers; handle of wood, securely bolted and braced.

Each

NO. 303—Length Blade, 30½ Inches; Width, 11 Inches; 1¾ Inch flanged ends and back; Handle 5 Feet Long; Weight Each, 10 Lbs. ..... $.....

Price on Application

ADZES

Are made by a special continuous forging process which thoroughly refines the steel. Blade is reinforced under the eye where the strain is greatest. The cutting edge is hand hammered and carefully tempered and ground to a thin, keen edge requiring but little grinding to keep tool sharp.

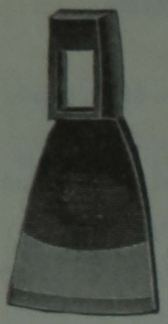


Fig. 3136

HOUSE CARPENTERS' FULL HEAD

Hand forged, non-rusting finish; polished bits.

Width Cut, Inches	4	4½
Length, Inches	8¾	9
Weight per Dozen, Lbs.	57	60
Per Dozen	$36.00	36.00

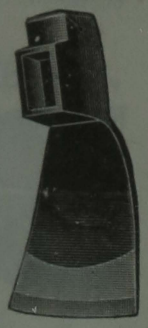


Fig. 3137

HOUSE CARPENTERS' HALF HEAD

Hand forged, non-rusting finish; polished bits.

Width Cut, Inches	4	4½
Length, Inches	9¼	9¼
Weight per Dozen, Lbs.	49½	51
Per Dozen	$36.00	36.00

Fig. 3138

RAILROAD—FULL HEAD

Hand forged, non-rusting finish; polished bits.

Width Cut, Inches	5
Length, Inches	9¼
Weight per Dozen, Lbs.	66
Per Dozen	$36.00

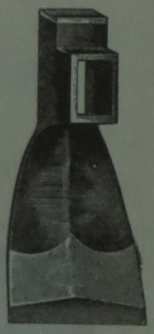


Fig. 3139

RAILROAD—HALF HEAD

Hand forged, non-rusting finish; polished bits.

Width Cut, Inches	5
Length, Inches	9¼
Weight per Dozen, Lbs.	54
Per Dozen	$36.00

Fig. 3140

SHIP CARPENTERS' SPUR HEAD

Hardened spur head; tempered and polished bit; black finish.

Plain		
Width Cut, Inches	4	4½
Length, Inches	11⅜	11⅜
Weight per Dozen, Lbs.	27¾	29¼
Per Dozen	$42.00	42.00
Lipped		
Width Cut, Inches	4½	5½
Length, Inches	11⅜	11⅜
Weight per Dozen, Lbs.	30	32
Per Dozen	$51.00	51.00

MATTOCKS

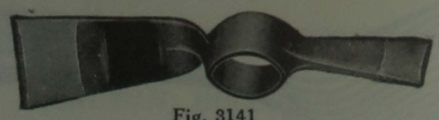


Fig. 3141

Hoe and cutter of hand forged crucible steel, tempered, ground and polished; forged steel body, finished black; adze eye.

LONG CUTTER

Weight Each, Lbs.	5	6
Size Hoe, Inches	8x3½	8¼x4
Size Cutter, Inches	5¾x3	6x3½
Per Dozen	$16.00	17.00

SHORT CUTTER

Weight Each, Lbs.	5	5½
Size Hoe, Inches	8x3½	8¼x4
Size Cutter, Inches	4½x3	4½x3½
Per Dozen	$16.00	16.50

PICK MATTOCKS

Fig. 3142

Adze eye; black finish forged steel body; polished point and cutter of hand forged crucible steel.

Weight Each, Lbs.	5	6
Size Hoe, Inches	8¼x3½	8¼x4
Length Pick, Inches	8	8½
Per Dozen	$16.00	17.00

PICKS

Fig. 3143

RAILROAD OR CLAY

Hand forged crucible steel points, polished; forged steel. black finished body; adze eye; chisel and diamond points,

Weight, Lbs.	5 to 6	6 to 7	7 to 8	8 to 9
Length, Inches	23½	24½	25½	26½
Per Dozen	$14.00	15.00	16.00	18.00

Fig. 3144

"V" TAMPING

Adze eye; one chisel and one tamping point, polished; natural finish body; forged from high grade crucible steel.

Weight Each, Lbs.	6	6 to 7	7 to 8	8 to 9	9
Length, Inches	23	24	25	26	26
Per Dozen	$18.00	18.00	19.00	20.00	21.00

Fig. 3145

CONTRACTORS'

Adze eye; high grade crucible steel; points polished; natural finish body.

Weight Each, Lbs.	6	6½	7	7½	
Length, Inches	24	24	25	25½	
Per Dozen	$17.50	18.00	18.50	19.00	
Weight, Lbs.	8	8½	9	9½	10
Length, Inches	25½	26	26	27	27
Per Dozen	$19.50	22.50	21.50	22.50	23.50

HANDLES

Made from highest grade, all white second growth, bastard cut swamp hickory butts; carefully seasoned; uniform quality; nicely finished.

Fig. 3146

MACHINISTS' HAMMER
NO. 578

Length, Inches	12	13	14	15	16
Weight per Dozen, Lbs.	5	5½	6	6½	7
Per Dozen	$2.45	2.45	2.45	2.45	2.65
Length, Inches	17	18	19	20	22	24
Weight per Dozen, Lbs.	7½	8½	9	11	12	14
Per Dozen	$2.95	2.95	3.35	3.35	4.25	5.45

Fig. 3147

CARPENTERS' HAMMER, ADZE EYE
NO. 576

Length, Inches	12	13	14	15	16
Weight per Dozen, Lbs.	5	5½	6	6¾	7½
Per Dozen	$1.90	1.90	1.90	1.90	2.15

6 Dozen in a Crate

Fig. 3148

LATH OR SHINGLE HATCHET
NO. 590

Length, Inches	12	14	15
Weight per Dozen, Lbs.	6	6	6½
Per Dozen	$1.90	1.90	1.90
Length, Inches	16	18	20
Weight per Dozen, Lbs.	7½	7½	9
Per Dozen	$2.25	2.65	3.40

6 Dozen in a Crate

BROAD AND BENCH HATCHET
NO. 527

Length, Inches	16	17	18	19	20
Weight per Dozen, Lbs.	7½	8	9	9½	10
Per Dozen	$2.75	3.55	3.55	3.95	4.25

Fig. 3149

RAILROAD PICK AND MATTOCK

	Per Dozen
NO. 539—36 Inches Long; Weight per Dozen, 37 Lbs.	$12.65

2 to 6 Dozen in a Crate

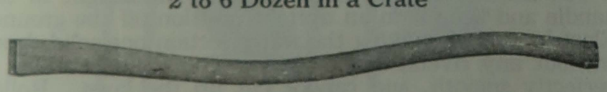


Fig. 3150

ADZE

	Per Dozen
NO. 536—32, 34 or 36 Inches Long; Weight per Dozen, 23 Lbs.	$11.65

2 to 6 Dozen in a Crate

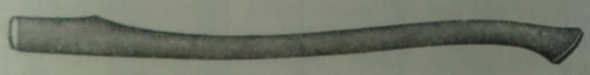


Fig. 3151

AXE—NO. 502

Length, Inches	28	30	32	34	36
Weight per Dozen, Lbs.	13	17	17	21	23
Per Dozen	$7.15	8.65	8.65	8.65	8.65

2 to 6 Dozen in a Crate

Fig. 3152

Hand shaved finish; standard pattern.

NO. 561
SLEDGE, MAUL OR STRIKING

Length, Inches	24	26	28	30	32
Weight per Dozen, Lbs.	14	16	16½	17	18
Per Dozen	$5.45	6.25	6.25	7.15	7.15
Length, Inches	34	36	38	40	42
Weight per Dozen, Lbs.	20	21	22	26	27
Per Dozen	$8.10	8.10	8.50	9.50	10.50

2 to 6 Dozen in a Crate

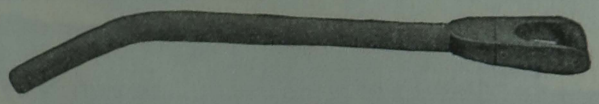


Fig. 3153

SHOVEL AND SCOOP

D handle riveted; regular bend; seasoned, selected ash; for all plain back shovels.

NOS. (Grade)	1	X	XX
Length, Inches,	30	30	30
Weight per Dozen, Lbs.	23	23	23
Per Dozen	$3.00	3.30	4.25

Fig. 3154

LONG SHOVEL

Seasoned, straight-grained ash; fits all regular socket strap and plain back; without ferrules or caps. Ames or Parkes Bend.

NOS. (Grade)	1	X	XX
Length, Feet	4½	4½	4½
Weight per Dozen, Lbs.	26	26	26
Per Dozen	$2.50	3.00	4.00

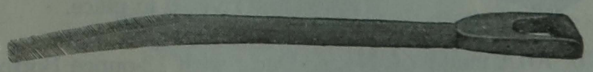


Fig. 3155

COKE OR STONE FORK

D handle; bored and chucked; riveted; seasoned ash.

NOS. (Grade)	1	X	XX
Length, Inches	30	30	30
Weight per Dozen, Lbs.	25	25	25
Per Dozen	$3.00	3.50	4.25

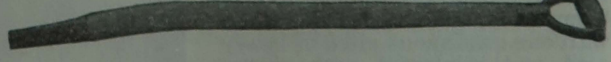


Fig. 3156

SPADING FORK

D handle; bent, bored and chucked; grip revolves on iron pin.

NOS. (Grade)	1	X	XX
Length, Inches	30	30	30
Weight per Dozen, Lbs.	35	35	35
Per Dozen	$4.55	5.05	5.80

All of Above, One Dozen in a Bundle

COAL CHUTES

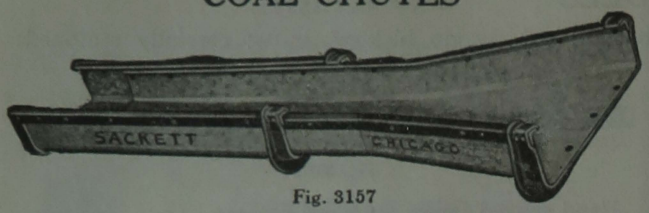


Fig. 3157

TELESCOPE—FOR HARD COAL

Quickly extended to length desired. Each section can be used as a separate chute and is built with Patent Angle Iron construction. Width at top, 22 inches; Width at bottom, 12 inches.

NOS.	Length Chute, Feet	Length Slide, Feet	Weight Each, Lbs.	Black Steel, Each	Galv., Each
502A	8	6	85	$16.50	$18.75
502B	10	8	107	19.50	22.50
502C	12	10	115	22.75	26.00

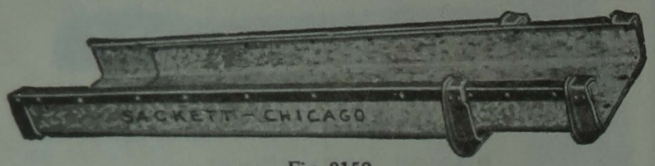


Fig. 3158

TELESCOPE—FOR SOFT COAL

Inside section of the soft coal Telescope chute is made 18 inches wide at both ends, and outside section sufficiently wide to slide easily. Each section has patent angle construction and can be used as an independent chute.

NOS.	Length Chute, Feet	Length Slide, Feet	Weight Each, Lbs.	Black Steel, Each	Galv., Each
503A	8	6	99	$17.00	$20.00
503B	8	8	112	19.00	22.25
503C	10	8	127	21.00	24.00
503D	10	10	131	22.50	26.75

COAL BAGS

Fig. 3159

ROPE TOP

Has extra side handles and heavy hemp rope sewed into the top rim. Handles extend down to double bottom. Side handles are set under edge of extra bottom and securely sewed and riveted in place.

No. 704A made of No. 4 Duck with 12-ounce Bottom. No. 704C made with No. 6 Duck with No. 6 Extra Bottom.

NOS.	Weight Each, Lbs.	Each
704A	2½	$1.45
704C	1¾	1.35

SINGLE BOTTOM

Made of hard weave No. 4 Duck; handles of canvas are large enough to allow a large gloved hand to grip them freely, and are each sewed on with one continuous piece of heavy cord and reinforced with rivets, which will not pull off.

Fig. 3160

Bag is strongly sewed throughout and reinforced with 36 coppered rivets. Capacity, 100 Lbs. Hard coal.

NOS.	Weight Each, Lbs.	Each
700A	1½	$1.00
700B	1	.90

LAWN MOWERS

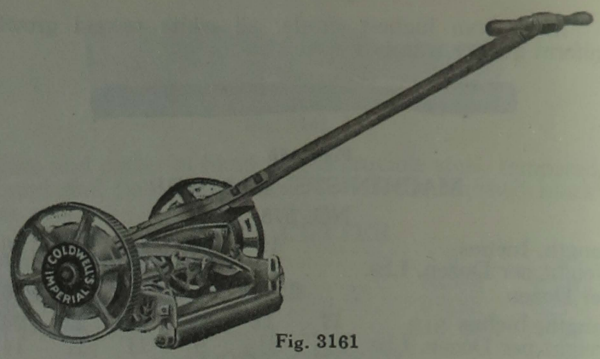


Fig. 3161

IMPERIAL

Made with parallel bearings, equipped with all the latest devices, such as patent reversible channel-shaped bottom knives, indestructible triple pawl ratchets, positive lock adjustment, renewable bronze bearings and a simple construction for mowing terraces. The blades can be easily sharpened without removing any parts. High wheels, 10¼ inches; four blades.

Length Blade, Inches	14	16	18	20
Each	$20.00	22.00	24.00	26.00

LAWN ROLLERS

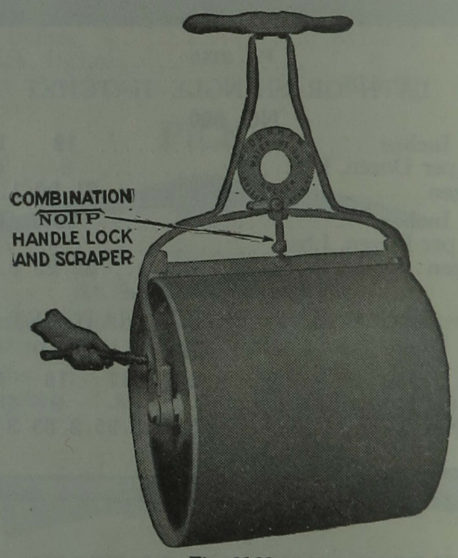


Fig. 3162

WATER WEIGHT

The handle weights counterbalance the weight of the handle and keep it in an upright position off the ground. Electric welded, making the water section one solid drum without any rivets; cannot leak. The rolling surface is perfectly smooth, and cannot cut up the lawn. Roller bearings on the axle insure easy running.

NOS.	Dia., Inches	Length, Inches	Sections	Weight Empty, Lbs.	Filled with Water, Lbs.	Each
HW2	14	20	1	120	235	$12.50
HW4	18	24	1	145	360	14.50
HW6	24	24	1	170	525	18.50
HW8	24	32	1	190	650	20.50
HW10	18	24	2	160	350	19.50
HW12	24	32	2	210	625	25.50
HW14	24	24	2	190	475	23.50

Note.—Above rollers weigh 50 per cent more when filled with sand.

SAND SCREENS

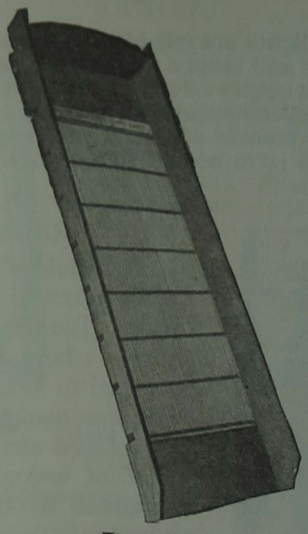


Fig. 3163

IMPROVED STRAIGHT BAR

Wood frames of best seasoned chestnut lumber ⅞ inch thick. The bar wires are No. 11 gauge hard drawn steel. They are accurately held in place by passing through spaced slots in a ½-inch sheet steel supporting channel. The supporting channels are 7 inches apart and pass across the screen from outside to outside of the wood frame to which they are fastened by means of large nails.

SMALL SIZE

NOS.	1	2	3	4
Space between Wires, Inch	⅜	¼	3/16	⅛
Outside Diam. of Frame, Inches	22x61	22x61	22x61	22x61
Screen Surface, Inches	20x42	20x42	20x42	20x42
Weight Each, Lbs.	27	27	27	27
Each	**$5.00**	**5.00**	**5.00**	**5.00**

LARGE SIZE

NOS.	1	2	3	4
Space between Wires, Inch	⅜	¼	3/16	⅛
Outside Diam. of Frame, Inches	26x68	26x68	26x68	26x68
Screen Surface, Inches	24x48	24x48	24x48	24x48
Weight Each, Lbs.	32	32	32	32
Each	**$6.50**	**6.50**	**6.50**	**6.50**

Can be furnished with leg at extra price.

COAL SCREENS

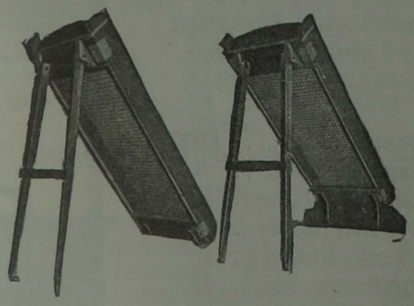


Fig. 3164

Frames made of seasoned chestnut lumber 1¼ inch thick. Bottom is fastened to the frame which is braced at the corners and over the ends of the wire with heavy galvanized sheet steel. Legs hinged at top are supplied with steel spurs, as is the bottom of frame, to prevent screen from slipping when in use. Mesh, ¼ to 2 inches.

NO	0
Outside Diameter Frame, Inches	33x77
Dimensions Bottom, Inches	30x60
Weight Each, Lbs.	100
Each	**$12.00**
With Footboard Guard, Each	**15.00**

SAFETY HOPPER CAR WRENCHES

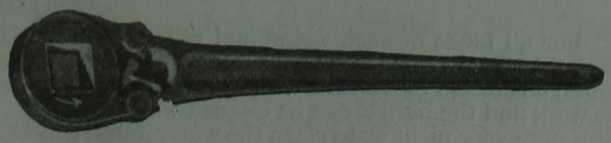


Fig. 3165

For use on hopper and side dump cars, etc. Has automatic safety features found in no other wrench. The top pawl is automatically thrown to safety the instant the wrench is lowered sharply so that all possibility of injuring the operator is eliminated.

Price on Application

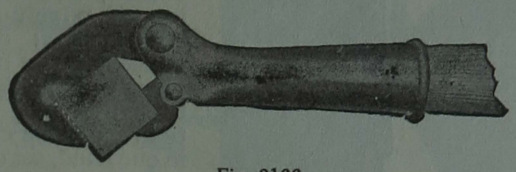


Fig. 3166

SELF-ADJUSTING

For dumping and winding up the pockets of hopper and drop bottom coal cars. Fits all winding taps; is self-adjusting and the jaws will grip the tightest when the pull is greatest. Loose jaw will release when tap spins toward operator.

NOS.	E42	F54
Length Handle, Inches	42	54
Weight Each, Lbs.	9	11
Each	**$5.00**	**6.00**

ANEMOMETERS

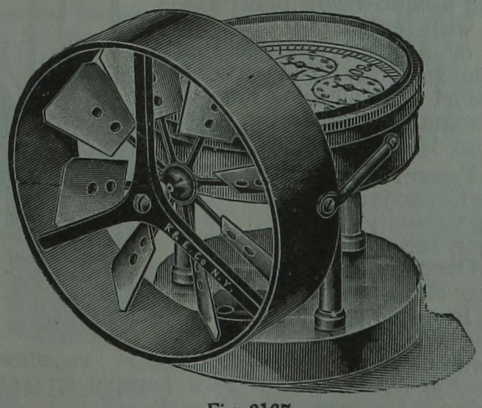


Fig. 3167

PORTABLE

For measuring velocity of air currents in mines, tunnels, sewers, public buildings, hospitals, etc. Has zero adjustment so that instrument can be set to zero before each reading. Should not be used in temperatures exceeding 300 degrees F. nor velocities of more than 2000 F. P. M.

Each

NO. 5952Z—Registers to 10,000,000 Feet; Diameter of Vanes, 2½ Inches; Weight Each, 1½ Lbs. . . **$28.75**

Packed a in Polished Mahogany Case

BRATTICE CLOTH

Cloth of plain jute yarn chemically treated. Used in mines to cover doorways to prevent the circulation of gases, fire damp, etc.

Prices on Application

CARBIDE LIGHTS

MILBURN

For all kinds of engineering and railway construction work. These lights are reliable, economical and efficient. Compact and portable and adaptable to almost any conditions; smokeless and steady without the use of mantles or globes; unaffected by vibration, wind or weather; light can be regulated by a needle valve. Reflector can be focused on the work and the burner can be cleaned while in action. They cannot be overcharged; it is unnecessary to throw out the water every night or to clean the water tank; generator is easily filled; there is practically nothing to break or get out of order; water automatically recedes from the carbide when the light is turned off so that over-generation and after-generation are minimized; ordinary lump carbide is used in these lights.

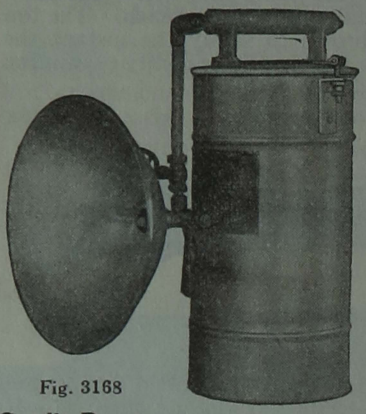


Fig. 3168

BUILDERS

Designed particularly for building construction, small foundations, trenches and tunnels; powerful light for its size; double swing joint on burner pipe allows light to be turned in any direction. Can be carried in one hand, set on the ground or hung on wall. Operating cost is only 1½ cents per hour.

Candle Power	500
Carbide Capacity, Lbs.	2½
Burning Capacity, Hours	10
Tank, Inches	7x14
Height Over All, Inches	10
Diameter Reflector, Inches	10
Weight Empty, Lbs.	11
Shipping Weight, Lbs.	28
Each	**$30.00**

NO. 22

For mines, tunnels, railroads and bridge construction and all work requiring a light-weight light. Furnished with either an open jet burner or a mica windshield or aluminum reflector. The burner is on a swivel joint allowing it to be set horizontally or vertically. Operating cost, ½ cent per hour.

Candle Power	100
Carbide Capacity, Lbs.	1
Burning Capacity, Hours	8
Diameter, Inches	6
Height Over All, Inches	11
Diameter Reflector, Inches	6
Weight Empty, Lbs.	3
Shipping Weight, Lbs.	8
Each, with Open Burner	**$10.00**

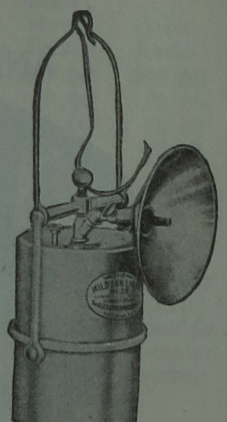


Fig. 3169

INDUSTRIAL

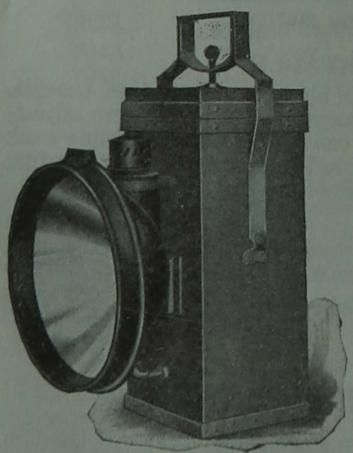


Fig. 3170

Particularly for rough industrial usage on farm and foundry tractors, mine locomotives, traction engines, logging and industrial railways, for building and construction work where a compact, powerful, steady light is required.

Candle Power	500
Carbide Capacity, Lbs.	2½
Burning Capacity, Hours	12
Size Tank, Ins.	7½x7½x19
Height Over All, Ins.	23
Diameter Headlight, Inches	11
Weight Empty, Lbs.	23
Shipping Weight, Lbs.	40
Each	**$75.00**

Fig. 3171

RELIANCE

Powerful but small and can be easily carried from place to place. The steady brilliant light covers a large area and can be directed to just the place where it is most needed. Reflectors are of polished aluminum with the back of wrought steel; air is admitted to the burner and mixed with the gas jet producing complete smokeless combustion. Operating cost is only ⅞ cent per hour.

Candle Power	1000
Carbide Capacity, Lbs.	1½
Burning Capacity, Hours	8
Body, Inches	7x25
Diameter Reflector, Inches	10
Weight Empty, Lbs.	17
Shipping Weight, Lbs.	32
Each	**$35.00**

NO. 8

Recommended for lighting large areas such as excavations, freight yards, quarries, piers, etc.; easily transported; light can be directed to any desired place. Standard and popular light for building contractors. Operating cost is only 3 cents per hour.

Candle Power	8000
Carbide Capacity, Lbs.	8
Burning Capacity, Hours	12
Height Over All, Inches	72
Diameter Tank, Inches	10
Diameter Reflector, Ins.	15
Weight Empty, Lbs.	60
Shipping Weight, Lbs.	85
Each	**$70.00**

NO. 12

Similar to No. 8 except larger throughout, with a 12,000 candle power.

Each **$85.00**

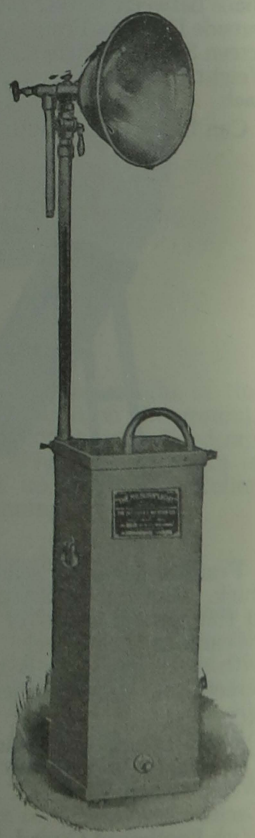


Fig. 3172

LANTERNS

VICTOR

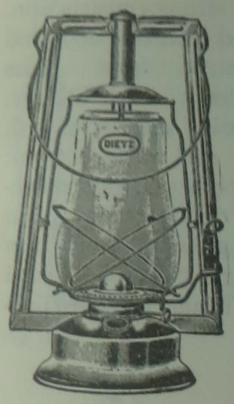


Fig. 3173

Of strong construction with square bright tin tubes, beaded vertically to obtain strength. Positive locking globe lift; dome-shaped solderless oil fount; safety wing lock; hot blast burner; large oil filler. Supplied with Fitzall globe and tinned wire globe guards.

	Per Dozen
NO. 0—Height Over All, 13¼ Inches; ⅝-Inch Wick; 4 Candle Power Light; (150° Kerosene Used); Fount Capacity, 19 Hours; Weight per Dozen, 38 Lbs.	$12.70
Add Extra for Ruby, Blue or Green Globes	3.20

UNDERWRITER—MILL

Square tubes, red enameled; braced frame; light in weight but strong and rigid in construction. Hinged wire guard may be padlocked to prevent access to the wick; provided with safety oil fount and security standing bail; patented brass eyelets and hinged hot blast cone burner. Oil filler is large. Supplied with Fitzall globe.

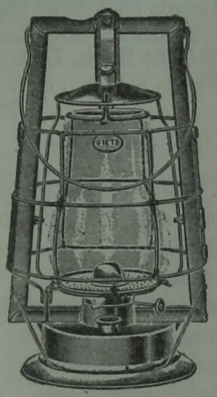


Fig. 3174

	Per Dozen
NO. 00—Height Over All, 13¼ Inches; ⅝-Inch Wick; 4 Candle Power Light; (150° Kerosene Used); Fount Capacity, 23 Hours; Weight per Dozen, 53 Lbs.	$37.40

WATCHMAN'S—MILL

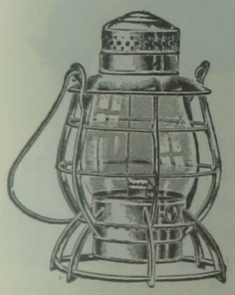


Fig. 3175

Cold rolled steel frame, enameled red; burns signal oil; fount and globe are inserted through a hinged top which may be locked by a padlock; outside wick raiser provides for the regulation of the flame; wick scraper attached removes the char; supplied with Vulcan globe.

	Per Dozen
NO. 000—Height Over All, 10¼ Inches; 1-Inch Wick; 2 Candle Power Light; Fount Capacity, 24 Hours; Weight per Dozen, 3 Lbs.	$34.10

All Above, Packed One Dozen in a Case

BEACON

Especially suitable for lighting platforms, boat landings, horse sheds, open air meetings, etc. Equipped with large fluted reflectors and tinned steel burner; globe lifts clear of the burner to permit trimming; **finished in green enamel.**

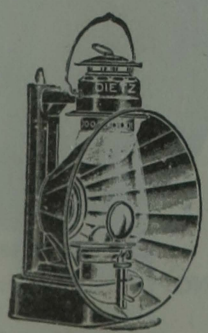


Fig. 3176

	Per Dozen
NO. 30—Height Over All, 15¼ Inches; 50 Candle Power Reflection; 1-Inch Wick; (150° Kerosene Used); Fount Capacity, 35 Hours; 2¼-Inch Lens; Weight per Dozen, 25 Lbs.	$42.20

One-quarter Dozen in a Case

RAILROAD SWITCH LAMPS

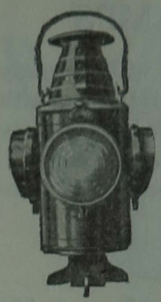


Fig. 3177

Strongly constructed of No. 18 gauge tinned steel with straight or slanting hoods, drawn steel oil fount; either long burning or one-day burner; sliding door with improved pressed steel water shed; malleable iron spring socket. Employs balanced draught or "No sweat" principle of ventilation. Can be furnished with two four-inch or four and one-eighth inch, and two four and one-half inch lenses, or lenses may be had all of same size in any color.

NO. 161

Size Lenses, Inches	4	4⅛	4½
Height, Inches	17½	17½	17½
Width, Inches	8½	8½	8½
Weight Each, Lbs.	11	11	11
Each, Long Burning Fount	$...	....	....
Each, One-Day Fount	$...	....	....

Prices on Application

Made of galvanized iron. Has updraught ventilator with bayonet lock cap; extension hood of one-piece drawn steel; sliding door with flat water shed; malleable iron socket. Furnished with lenses of any color. May be had with either No. 8 drawn tin, one-day fount and No. 2, separable no chimney burner, or with Style "A" tinned drawn steel long burning fount and long time burner.

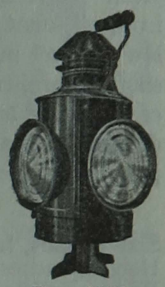


Fig. 3178

NO. 1

Size Lenses, Inches	5	5⅜
Height, Inches	15⅞	15⅞
Width, Inches	8⅝	8⅝
Weight Each, Lbs.	8	8
Each, Long Burning Fount	$....	....
Each, One-Day Burning Fount	$....	....

Prices on Application

SEMAPHORE LAMPS

Railway Signal Association Standard

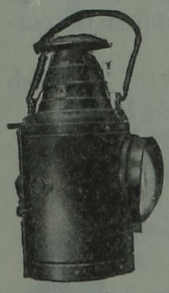


Fig. 3179

Constructed entirely of No. 18 gauge, tinned steel with separate, drawn steel, one-piece slanting hood. Lens and hood holders are u-shaped, with adjustable band. Ventilator is of the balanced draught or "No sweat" type; R. S. A. Pattern steel socket. May be had with either No. 152 tinned, drawn steel, long burning fount, 31 ounce capacity and No. 25 long time burner, or with No. 0 interchangeable, one-day, no chimney, long shaft burner. Supplied with prismatic glass reflector when requested.

NO. 157

Size Lenses, Inches	5	5⅜
Height, Inches	14¾	14¾
Width, Inches	8⅝	8⅝
Weight Each, Lbs.	8¼	8½
Each, Long Burning Fount	$...	....
Each, One-Day Burning Fount	$...	....

Prices on Application

AUTOMATIC ENGINE SIGNAL LAMPS

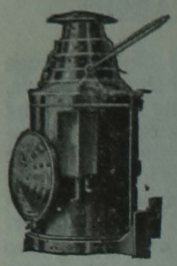


Fig. 3180

Made of tinned steel with two-way malleable iron bracket. Equipped with improved type of holders; one-day fount and burner, and employs balanced draught or "No sweat" principle of ventilation.

NO. 175

Size Lenses, Inches	5	5 3/8
Height, Inches	15	15
Width, Inches	10 1/2	10 1/2
Weight Each, Lbs.	10	10
Each	$....	....

Prices on Application

TAIL MARKER LAMPS

Strongly constructed of heavy tinned steel. Reversible bracket is of malleable iron; oil fount of drawn steel with No. 1 low Dressel burner, either long or short shaft. Furnished with three or four lenses of any color and of varying diameters, if desired. Balanced draught or "No sweat" principle of ventilation.

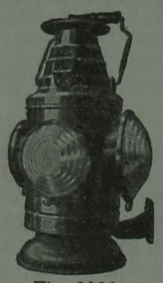


Fig. 3181

NO. 166

Size Lenses, Inches	5	5 3/4	4
Height, Inches	15 1/2	15 1/2	15 1/2
Width, Inches	10 1/4	10 1/4	10 1/4
Weight Each, Lbs.	9	9	9
Each, Four Lenses	$....	....	....
Each, Three Lenses	$....	....	....

Prices on Application

STEAM GAUGE LAMPS

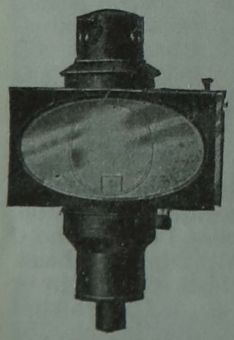


Fig. 3182

For use in locomotive cabs for illuminating steam gauge dials. Made of heavy tin, japanned. Furnished with No. 1, single high tube, lard oil, ratchet burner, 2 1/2-inch shaft; inside oil pot. Height of flame can be regulated from the outside of lamp.

Each

NO. 125—Height, 10 1/2 Inches; Weight Each, 1 3/8 Lbs.. $.....

Prices on Application

WATER GAUGE LAMPS

Material used in construction identical to that used in No. 125, and possesses similar features, but is used for illuminating water gauges in locomotives' cabs.

Each

NO. 126—Height, 10 1/2 Inches; Diameter, 3 1/4 Inches; Weight Each, 1 Lb..... $.....

Price on Application

Fig. 3183

HEADLIGHTS

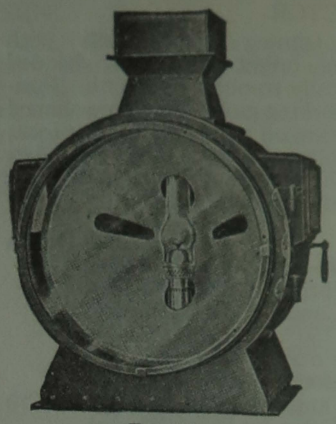


Fig. 3184

Of strong construction. Fitted with side door and patented front glass holders; steel blinder; frames of sheet steel with sheet and angle bottom; silver-plated copper reflector; double thick plain front glass; malleable iron fittings; No. 100 Dressel or Williams standard burner.

NO. 110

Size, Inches	14	16	18	20	23
Diameter Reflector, Inches	14	16	18	20	23
Depth Reflector, Inches	7	8	9	11 1/4	13 1/2
Diameter Front Glass, Inches	14 3/4	16 15/16	18 7/8	20 7/8	23 3/4
Weight Each, Lbs.	50	55 1/2	60	75	..
Each	$....	....	....	....	....

Prices on Application

For use on tenders or small locomotives. Fittings of malleable iron; frame of sheet steel; strongly constructed; bottom of steel with angle iron reinforcement. Fitted with side door; double thick plain front glass; silver-plated copper reflector and No. 5 Burner with No. 30 Chimney.

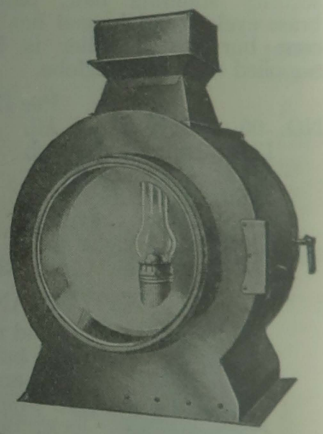


Fig. 3185

NO. 160

Size, Inches	10	12	14
Diameter Reflector, Inches	10	12	14
Depth Reflector, Inches	4 1/2	5 1/4	7 1/4
Diameter Front Glass, Inches	11	13	15
Weight Each, Lbs.	27	27	32
Each	$....	....	....

Prices on Application

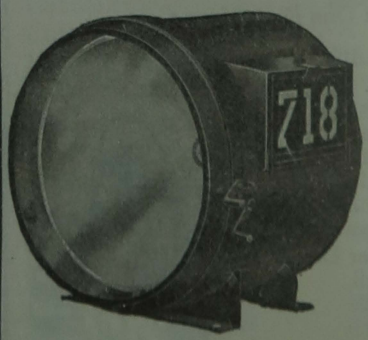


Fig. 3186

ELECTRIC

Side number frames are of steel; fittings of malleable iron. Fitted with steel front door and patented glass holders; quick acting focusing device which remains rigid when set; crystal front glass; plain and opal side glasses silver-plated copper reflector.

Each

NO. 718—Diameter Front Glass, 20 x 3/16 Inches Thick; Side Glass, 5 5/8 x 9 5/8 Inches; Reflector, 18 x 9 Inches; Weight Each, 60 Lbs.... $...

Prices on Application

INSPECTORS' AND LOCOMOTIVE TORCHES

Fig. 3187

Used extensively by railroads; durable, non-explosive; constructed of cold rolled steel; heavily electro copper plated inside and out; highly polished; riveted strap handle.

	Per Dozen
NO. 26—Capacity, 1 Pint; 15 Inches High; Diameter, 2 Inches; Weight per Dozen, 5 Lbs.	$12.00

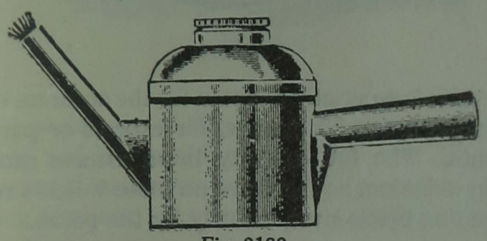


Fig. 3188

Especially designed for railroad use; non-explosive and very durable; made of cold rolled steel; heavily electro copper plated inside and out. Highly polished; torch and handle welded to reservoir.

NOS.	27	28
Capacity, Pints	1½	2¼
Height, Inches	4½	4½
Diameter, Inches	4⅛	5¼
Length Torch, Inches	13¼	14
Length Handle, Inches	6	6½
Weight per Dozen, Lbs.	11	14
Per Dozen	$12.00	15.00

JACKET LAMPS

Fig. 3189

Seamless drawn cold rolled steel, copper plated; safe for use with any kind of oil; furnished only with round torch burners, but chimney burners can be used; riveted hook handle.

NOS	20	20½	21
Capacity, Pints	5/16	½	1
Diameter, Inches	3⅜	3¾	4⅛
Length Torch, Inches	4	4¼	4½
Weight per Dozen, Lbs.	3½	6½	7
Per Dozen	$6.00	9.00	12.00

Seamless drawn from cold rolled steel, copper plated; top is double-seamed to one piece body; furnished only with round torch burners, but may be used with chimney burners; riveted strap handle.

Fig. 3190

NOS.	22	23	24
Capacity, Pints	1	1½	2¼
Diameter, Inches	3¼	4	4⅞
Length Torch, Ins.	5¾	5¾	6½
Wgt. per Doz., Lbs.	7½	9	13
Per Dozen	$9.00	12.00	15.00

PYRAMID TORCHES

Fig. 3191

Stout, durable torch for factories, foundries, rolling mills, blast furnaces and construction work; seams hard spelter brazed; therefore will not leak; constructed of heavy steel; extra heavy handle securely riveted; top is furnished with chain and hook.

NOS.	80H	81H	82H	83H	84H
Capacity, Pints	½	1	2	2	4
Height, Inches	8	6	8	8	10
Diameter, Inches	4	4½	5¾	5¾	7
Weight per Dozen, Lbs.	11	12	14	15	18
Per Dozen	$7.00	9.00	10.00	11.00	12.00

Heavy brazed steel; used by locomotive or stationary engineers; seams hard spelter brazed and will not leak; malleable iron handle securely riveted; furnished with strap handle if preferred.

Fig. 3192

NOS.	110H	120H
Capacity, Pints	1	2
Height, Inches	9½	9
Diameter, Inches	4	5¾
Weight per Dozen, Lbs.	16	18
Per Dozen	$9.00	10.00

ILLUMINATING TORCHES

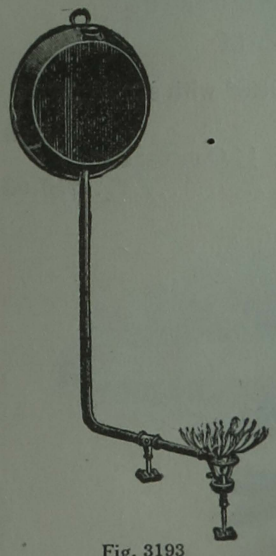


Fig. 3193

BALL TYPE

Are particularly adapted for use in factories, foundries, machine shops, rolling mills, blacksmith shops, warehouses, markets, etc. Gasoline burner produces a light equal to 8 ordinary gas lights; expense for burning is approximately one cent per hour; made with heavy tin tank and heavy cast brass burners; stuffing boxes are fitted to burner and valve, making them durable and preventing leaks; japanned gas pipe and malleable iron hangers, securely fastened to tank. Can be furnished with double burners if desired.

	Each
NO. 20—Capacity, 6 Quarts; Weight Each, 4¼ Lbs.	$9.20

EXTRA PARTS

NO. BB—Burner only Weight Each, 1½ Lbs.	$4.00
NO. BV—Valve only Weight Each, 5 Ounces.	1.20

POSTAL AND PACKAGE SCALES

FAIRBANKS

This type of postal scale has been adopted by the United States Government and is suitable for weighing mail matter of all kinds.

The construction is strong and durable throughout all parts, being of high grade material and carefully fitted to produce lasting sensitiveness and accuracy.

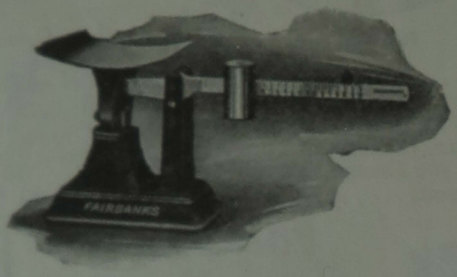


Fig. 3194

Compact and convenient to use. Has brass beam with notched top and brass poise.

Each

NO. 613—Capacity, 16x½ Ounces; Pan, 4¾x3¼ Inches..... $7.00

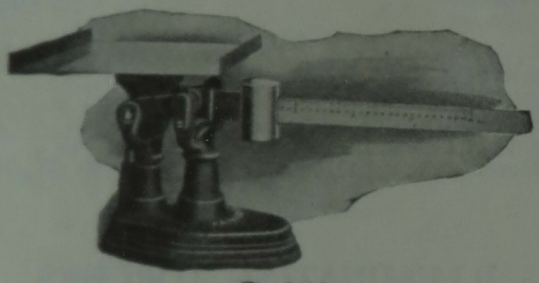


Fig. 3195

SINGLE BEAM

Has single beam, notched and fitted with sliding poise.

Each

NO. 605—Capacity, 4 Pounds x ½ Ounces; Pan, 8x7 Inches.....$12.00

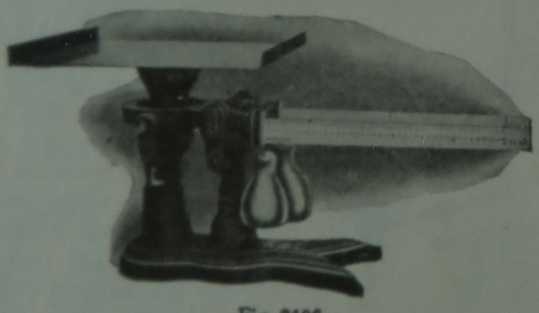


Fig. 3196

DOUBLE BEAM

Has double beam with hanging poise and is especially adapted for weighing packages.

Each

NO. 615—Capacity, 15 Pounds x ½ Ounces; Pan, 10½x10½ Inches.....$18.00

PLATFORM COUNTER SCALES

FULL CAPACITY BEAM

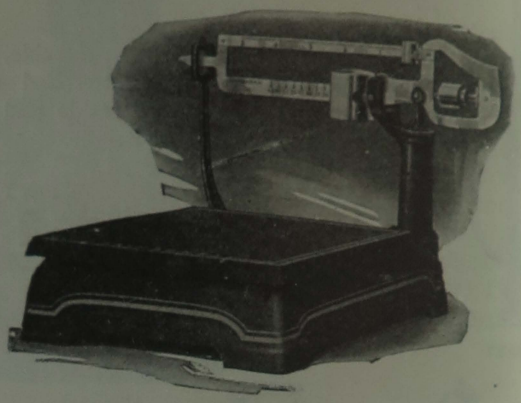


Fig. 3197

This scale is especially adapted for the accurate weighing of packages up to 55 pounds, for express or parcel post shipments. The full capacity beam assures exceptional speed in weighing, as there are no loose weights required, each reading being given directly by the poises.

The beam is of the arrow-tip pattern, of brass with notched top and brass sliding poises. The upper bar is graduated to 5 pounds x 1 ounce, the lower to 50 pounds x 5 pounds.

Each

NO. 532—Capacity, 55 Pounds x 1 Ounce; Beam Upper, 5 Pounds x 1 Ounce; Lower, 50 Pounds x 5 Pounds; Size Platform, 10½x12 Inches... $24.00

RATIO SCALES

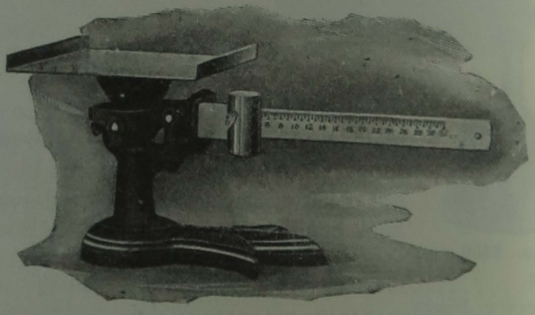


Fig. 3198

Of special design; gives the weight of a dozen articles by simply weighing one. For obtaining the weight of underwear, knit goods, linen wear and kindred products in dozen lots, the scale is of exceptional convenience, saving considerable time and handling of the goods and giving the result accurately. The pan is of brass and turned up on two sides to form a convenient holder for the goods to be weighed. The beam is also of brass with smooth top graduated on front and back, front graduations giving the actual weight and the back graduations twelve times the actual weight.

Each

NO. 477—Capacity, 2 Pounds x ¼ Ounce; Pan, 8 x 7 Inches.....$14.00

COUNTER SCALES

SCOOP OR PLATE

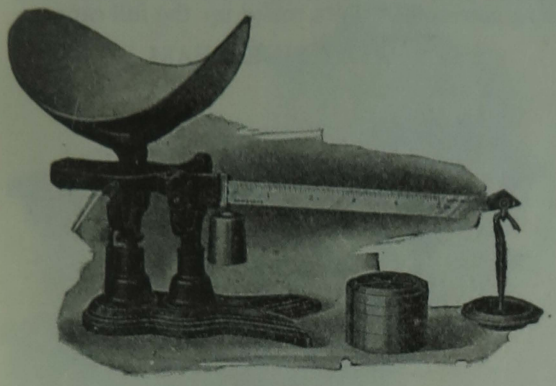


Fig. 3199

These scales are of the popular counter type adapted for store and household use. Scales Nos. 555 and 565 have extra large scoops and are for special uses such as weighing feathers, silks and other light bulky articles of great value.

Scales Nos. 590 and 592 are suitable for weighing drugs, spices and other high-priced products.

NOS.	Description	Capacity, Lbs.	Beam	Each
554	Tin scoop	35	5 Lbs.x½ oz.	$15.00
555	½-bu. tin scoop	35	8 Lbs.x1/16 oz.	18.00
565	½-bu. brass scoop	35	8 Lbs.x1/16 oz.	21.00
556	Brass scoop	35	5 Lbs.x½ oz.	17.00
557	9¾-inch iron plate	35	8 Lbs.x1/16 oz.	14.00
590	Single beam, tin scoop	8	5 Lbs.x1/16 oz.	12.00
592	Single beam, brass scoop	8	5 Lbs.x1/16 oz.	14.00

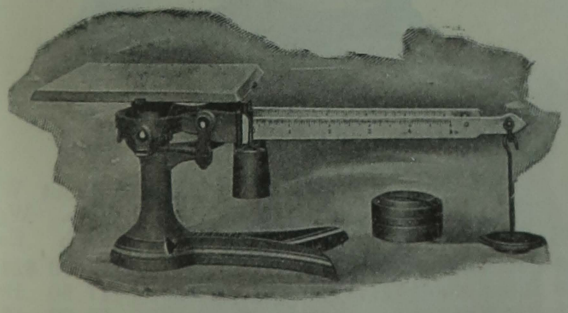


Fig. 3200

Similar to the above, but with 10-inch square opal glass plate firmly held in suitable prongs and offering a sanitary and easily cleaned surface. The arrow-tip brass beam may be single or double and has notched top for use with the nickel plated hanging poise. Suitable for weighing butter, meat, provisions, etc.

NOS.	Description	Capacity, Lbs.	Beam	Each
564	Single beam	25	5 Lbs.x½ oz.	$15.00
566	Double beam	25	5 Lbs.x2 oz.	17.00

COUNTER SCALES

SCOOP AND FULL CAPACITY BEAM

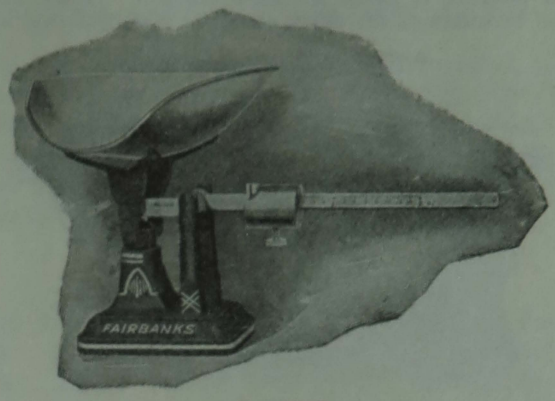


Fig. 3202

NOS. 473 and 474

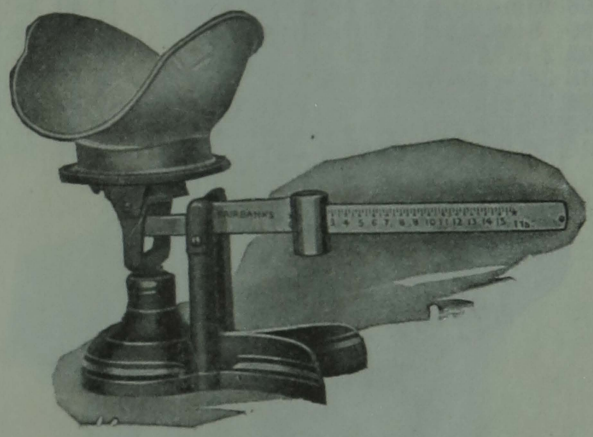


Fig. 3203

NO. 496

These scales are especially convenient for weighing confectionery or for putting up packages in small quantities. Small and compact, and with firm base. Fitted with full capacity beam; no loose weights are required. No. 473 has a double beam and Nos. 474 and 496 a single beam. The beam of Nos. 473 and 474 has a smooth top, turned at an angle and fitted with sliding brass poise and set-screw, the poise being partly cut away to show the graduations beneath. The number 496 is well adapted for weighing tobacco.

NOS.	Capacity, Lbs.	Oz.	Beam, Lbs.	Oz.	Scoop, Inches	Each
473	4 x	¼	*		12½ L.x9 W.x2¾ D.	$18.00
474	2 x	¼	2 x	¼	11 L.x7½ W.x2½ D.	14.00
496	1 x	¼	16 x	¼	10 L.x5 W.x3¼ D.	12.00

*Beam graduations.—No. 473, front bar, 16x¼ oz.; back bar, 3x1 lbs.

TRIP SCALES

These scales may have a round, flat, opal glass load plate with an iron weight plate or two iron plates, the glass offering a more sanitary service. They may be furnished with or without a brass side beam and with agate bearings at an extra charge. Nickel-plated loose weights in convenient units make up the full capacity.

WITHOUT SIDE BEAM

Fig. 3204

With Two Iron Plates

NOS.	Equipment	Capacity Lbs. Oz.	Without Wgts., Each	With Wgts., Each
797	12 ins. op. glass & 9 ins. ir. pl.	16 x ¼	$15.00	$18.00
798	10 ins. op. glass & 7 ins. ir. pl.	10 x ¼	11.50	14.00
799	8 ins. op. glass & 6 ins. ir. pl.	6 x ¼	11.00	12.00
925	2-10¾ ins. iron plates	25 x ¼	18.00	22.00
813	2-8¾ ins. iron plates	16 x ¼	13.00	16.00
814	2-7 ins. iron plates	10 x ¼	10.50	13.00
815	2-6 ins. iron plates	6 x ¼	9.50	11.00
816	2-5 ins. iron plates	2 x ¼	9.00	10.00

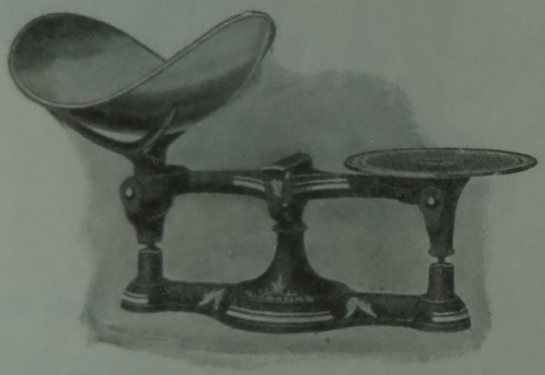


Fig. 3205

With Open Scoop and Iron Plate

NOS.	Capacity	Without Wgts., Each	With Wgts., Each
921	Tin scoop, 25 lbs. x ¼ oz.	$20.00	$24.00
701	Tin scoop, 16 lbs. x ¼ oz.	15.00	18.00
702	Tin scoop, 10 lbs. x ¼ oz.	11.50	14.00
703	Tin scoop, 6 lbs. x ¼ oz.	10.50	12.00
704	Tin scoop, 2 lbs. x ¼ oz.	10.00	11.00
923	Brass scoop, 25 lbs. x ¼ oz.	22.00	26.00
709	Brass scoop, 16 lbs. x ¼ oz.	17.00	20.00
710	Brass scoop, 10 lbs. x ¼ oz.	13.50	16.00
711	Brass scoop, 6 lbs. x ¼ oz.	11.50	13.00
712	Brass scoop, 2 lbs. x ¼ oz.	11.00	12.00

With Funnel Scoop and Iron Plate

NOS.	Equipment	Capacity, Lbs.	Without Wgts., Each	With Wgts., Each
725	Brass scoop	16	$20.00	$23.00
726	Brass scoop	10	15.50	18.00
727	Brass scoop	6	13.50	15.00
728	Brass scoop	2	13.00	14.00

WITH SIDE BEAM

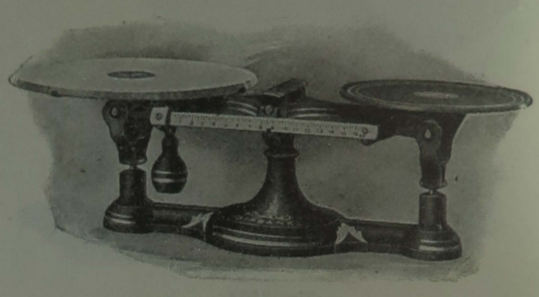


Fig. 3206

With Opal Glass Plate and Iron Plate

NOS.	Equipment	Capacity Lbs.	Side Beam	Without Wgts., Each	With Wgts., Each
801	12 ins. op. gl. & 9 ins. ir. pl.	16	16x¼ oz.	$17.00	$19.00
802	10 ins. op. gl. & 7 ins. ir. pl.	10	16x¼ oz.	13.50	15.00
803	8 ins. op. gl. & 6 ins. ir. pl.	6	16x¼ oz.	12.00	13.00
926	2 10¾ ins. iron plates	25	32x¼ oz.	21.50	24.00
817	2 8¾ ins. iron plates	16	16x¼ oz.	15.00	1.700
818	2 7 ins. iron plates	10	16x¼ oz.	12.50	14.00
819	2 6 ins. iron plates	6	16x¼ oz.	11.00	12.00
820	2 5 ins. iron plates	2	8x¼ oz.	10.50	11.00

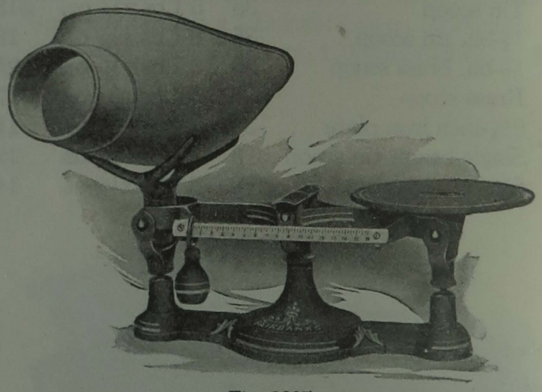


Fig. 3207

With Funnel Scoop and Iron Plate

NOS.	Equipment	Capacity Lbs.	Beam Oz. Side	Without Wgts., Each	With Wgts., Each
729	Brass scoop	16	16	$22.00	$24.00
730	Brass scoop	10	16	17.50	19.00
731	Brass scoop	6	16	15.00	16.00
732	Brass scoop	2	8	14.50	15.00

With Open Scoop and Iron Plate

NOS.	Capacity	Side Beam	Without Wgts., Each	With Wgts., Each
922	Tin scoop 25 lbs. x ¼ oz.	32 x ¼ oz.	$23.50	$26.00
705	Tin scoop 16 lbs. x ¼ oz.	16 x ¼ oz.	17.00	19.00
706	Tin scoop 10 lbs. x ¼ oz.	16 x ¼ oz.	13.50	15.00
707	Tin scoop 6 lbs. x ¼ oz.	16 x ¼ oz.	12.00	13.00
708	Tin scoop 2 lbs. x ¼ oz.	8 x ¼ oz.	11.50	12.00
924	Brass scoop 25 lbs. x ¼ oz.	32 x ¼ oz.	25.50	28.00
713	Brass scoop 16 lbs. x ¼ oz.	16 x ¼ oz.	19.00	21.00
714	Brass scoop 10 lbs. x ¼ oz.	16 x ¼ oz.	15.50	17.00
715	Brass scoop 6 lbs. x ¼ oz.	16 x ¼ oz.	13.00	14.00
716	Brass scoop 2 lbs. x ¼ oz.	8 x ¼ oz.	12.50	13.00

PLATFORM COUNTER SCALES

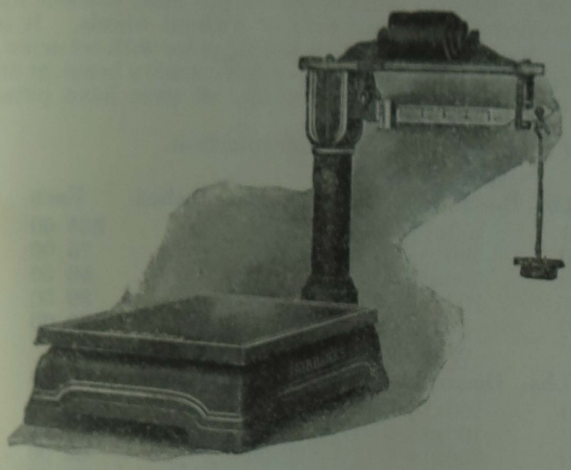


Fig. 3208

WITH SHORT IRON PILLAR

A strong, compact scale for counter use in retail stores or in factories for weighing parts. Scales Nos. 1216, 1220 and 10759 are fitted with suspension bearings, making them extremely sensitive and suitable for weighing silk or brass, copper and other high priced metals. Scale No. 1220 is regularly furnished with brass weights.

NOS.	Capacity, Lbs. Oz.	Beam, Lbs. Oz.	Size Platform, Inches	Height Over All, Inches	Each
528	200 x 1	5 x 1	10½x14	18½	$24.00
1212	300 x 2	10 x 2	13½x19½	28	32.00
1216	300 x ¼	3 x ¼	13½x19½	28	40.00
1220	300 x ¼	3 x ¼	13½x19½	28	60.00
10759	300 x ¼	3 x ¼	13½x19½	28	50.00

WITH SPLIT-HOOP SCOOP AND FORK

The scale here illustrated is commonly known as the Union scale, being a combination of platform and counter scale. It has a capacity of 30 lbs. x ½ oz. in the scoop and 240 lbs. x ¼ lb. on platform. It is furnished with either single or double beam, brass or tin seamless scoop.

NOS.	Description	Size Platform, Inches	Capacity, Lbs.	Each
508	Single Beam, Tin Scoop	10½x13½	240	$18.00
510	Single Beam, Brass Scoop	.....	240	20.00
512	Double Beam, Tin Scoop	.....	240	20.00
514	Double Beam, Brass Scoop	.....	240	22.00

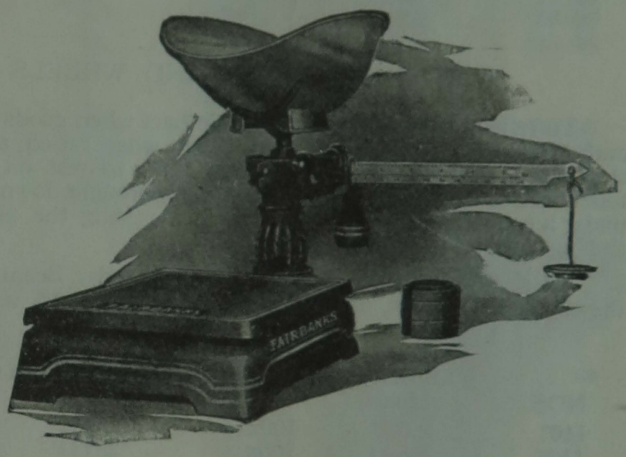


Fig. 3209
With Single Beam

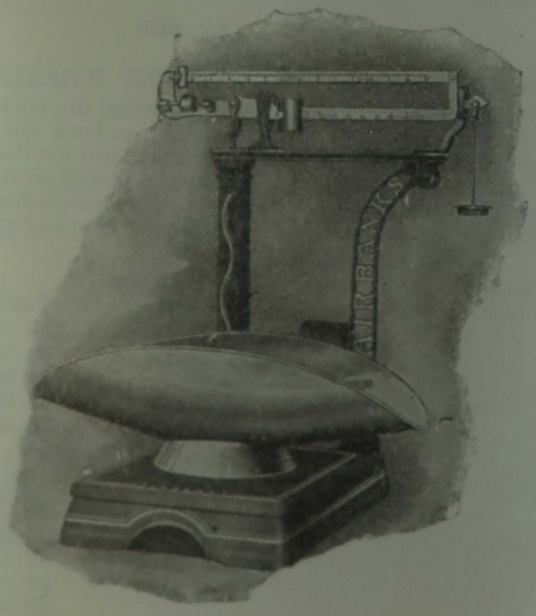


Fig. 3210
Platform Scale with Scoop

WITH DOUBLE BEAM

This is a high capacity scale for counter use for weighing the heavier commodities. It is built of metal throughout and is furnished with iron platform with either tin or brass scoop and also with marble platform without scoop for weighing meats or other provisions in large drafts.

NOS.	Description	Capacity, Lbs. Oz.	Size Platform, Inches	Each
505	Seamless Tin Scoop	250 x 1	12 x 15	$36.00
507	Seamless Brass Scoop	250 x 1	12 x 15	38.00
521	Marble Platform Only	250 x 1	12½ x 15½	36.00

Note.—In the platform sizes above, the **first** figure is the dimension parallel with the beam.

PORTABLE PLATFORM SCALES

WITH OR WITHOUT WHEELS

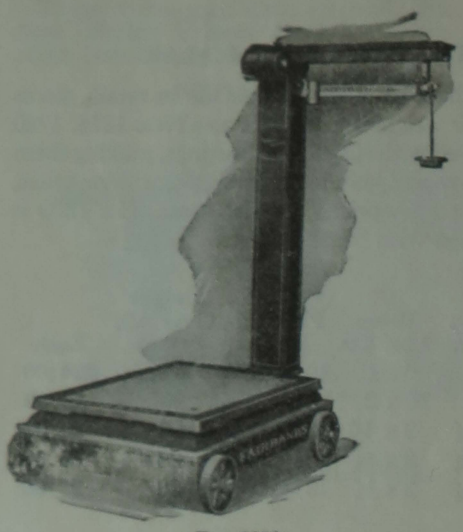


Fig. 3211

This type of portable platform scale is one of the most efficient for general use and may be furnished either with or without wheels. It is equipped with arrow-tip single beam having a sliding poise with set-screw, all of brass. Also furnished with double beam, or full capacity beam, at an additional price. From 1,500-pound capacity up, all sizes have pillar braced with iron rods.

Finished in blue and gold, well varnished for protection.

Without Wheels

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1100	2,500	100x½	25x34	$85.00
1102	2,000	100x½	25x32	75.00
1104	1,500	100x½	22x31	56.00
1108	1,000	100x½	18x27	39.00
1112	500	50x¼	16x25	30.00

With Wheels

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1116	2,500	100x½	25x34	$90.00
1118	2,000	100x½	25x33	80.00
1120	1,500	100x½	22x31	60.00
1124	1,000	100x½	18x27	43.00
1128	500	50x¼	16x25	33.00

WITH DROP LEVER AND WHEELS

To relieve the mechanism from impact when goods are taken on and off. A drop lever is provided which, when raised, acts to lower the lever system so that the platform comes to rest on lugs at the four corners. In weighing, the drop lever is brought down and fastened under a convenient hook on the cap, thus raising the platform from the lugs into its free weighing position.

All sizes have pillar braced with iron rods. Beam is single, of the arrow-tip pattern, of brass with sliding poise and set-screw.

NOS.	Capacity Lbs.	Beam Lbs.	Size Platform Inches	Each
1167	3,000	100x½	26x34	$114.00
1166	2,500	100x½	25x34	100.00
1168	2,000	100x½	25x32	90.00
1170	1,500	100x½	22x31	70.00
1174	1,000	100x½	18x27	53.00
1178	500	50x¼	16x25	43.00

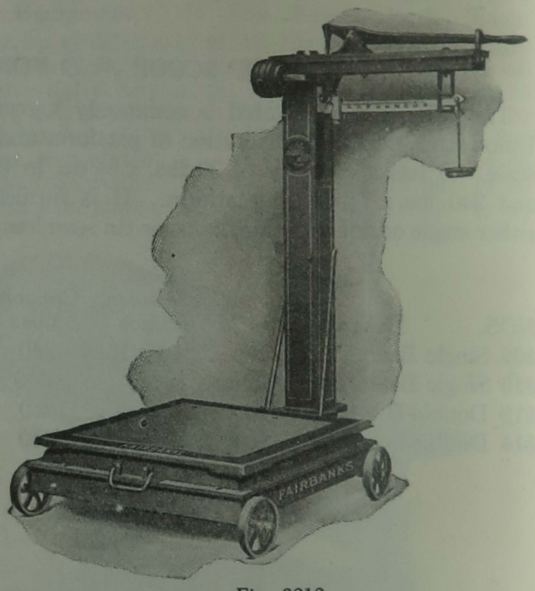


Fig. 3212

WITH BACK RAIL, WITH OR WITHOUT WHEELS

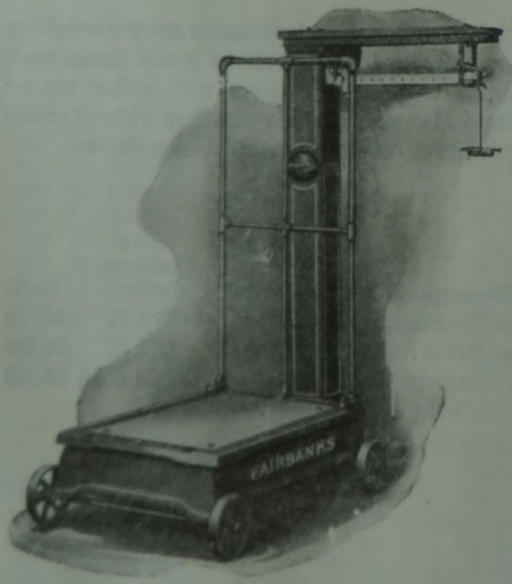


Fig. 3213

To prevent bulky packages from leaning against the scale pillar when weighing, this scale is fitted with a special iron back rail rigidly fastened to the platform and acting as an effective guard for the pillar. This device also allows more bags or packages to be placed on the platform and weighed at the same time. The arrow-tip single beam has sliding poise with set-screw, all of brass. Finished in blue and gold.

Without Wheels

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1132	2,500	100x½	25x34	$95.00
1134	2,000	100x½	25x32	83.00
1136	1,500	100x½	22x31	64.00
1140	1,000	100x½	18x27	44.00
1144	500	50x¼	16x25	35.00

With Wheels

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1148	2,500	100x½	25x34	$100.00
1150	2,000	100x½	25x32	88.00
1152	1,500	100x½	22x31	68.00
1156	1,000	100x½	18x27	48.00
1160	500	50x¼	16x25	38.00

Note.—In the platform size above, the **first** figure is the dimension parallel with the beam.

PORTABLE PLATFORM SCALES

SQUARE PLATFORM WITH OR WITHOUT WHEELS OR BACKRAIL

The square platform adapts this scale for weighing bulky packages. An iron back rail may be furnished, rigidly fastened to the platform to prevent the bulky loads from leaning against the scale pillar, also allowing more bags or packages to be weighed at the same time. From 1,500 pounds up, all sizes have pillar braced with iron rods. Furnished regularly with single brass arrow-tip beam and sliding poise with set-screw, but double beam and full capacity beam can be furnished on special order. Supplied with or without wheels. Finished in blue and gold.

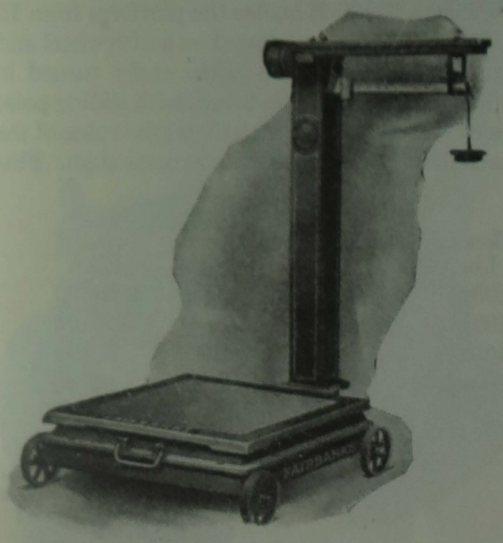


Fig. 3214

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
		With Wheels		
1501	500	50x¼	23x23	$52.00
1503	1,000	100x½	25x25	67.00
1507	1,500	100x½	29x29	88.00
1509	2,000	100x½	31x31	118.00
		With Wheels and Back Rail		
1529	500	50x¼	23x23	$57.00
1531	1,000	100x½	25x25	72.00
1535	1,500	100x½	29x29	96.00
1537	2,000	100x½	31x31	126.00
		Without Wheels		
1487	500	50x¼	23x23	$48.00
1489	1,000	100x½	25x25	63.00
1493	1,500	100x½	29x29	84.00
1495	2,000	100x½	31x31	113.00

SQUARE PLATFORM, DROP LEVER AND WHEELS

Same as above, but fitted with drop lever to relieve the mechanism from impact when goods are put on and taken off. Regularly furnished with single brass arrow-tip beam, with sliding poise and set-screw. All sizes have pillars braced. Finished in blue and gold.

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1515	500	50x¼	23x23	$62.00
1517	1,000	100x½	25x25	77.00
1521	1,500	100x½	29x29	98.00
1523	2,000	100x½	31x31	128.00

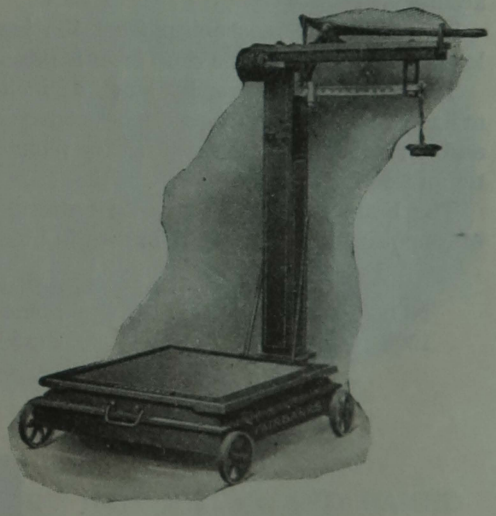


Fig. 3215

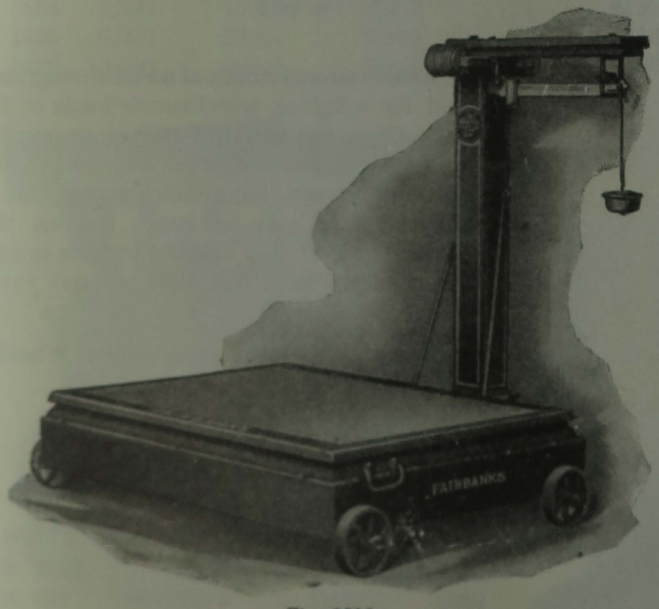


Fig. 3216

LARGE PLATFORM, WITH WHEELS

For bags of grain, flour, feed, or other materials which are bulky in proportion to their weight, the size and shape of the platform of this scale offers exceptional advantage and convenience in handling and weighing.

Furnished either with or without wheels, No. 1310 having the wheels parallel with the beam and No. 1316 as shown. No. 1316 also has pillar braced with iron rods. The arrow-tip beam is regularly single, of brass with brass poise and set-screw. Finished in blue and gold.

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1310	1,000	100x½	42x30	$90.00
1316	2,000	100x½	44x34	110.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

PORTABLE PLATFORM SCALES

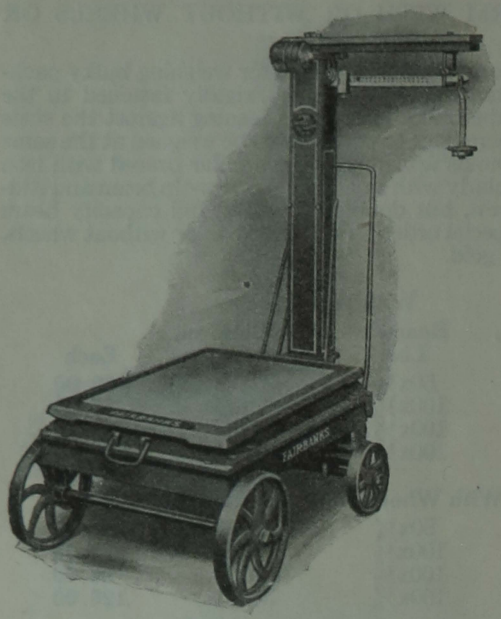


Fig. 3217

WITH WROUGHT IRON HANDLE AND FIFTH WHEEL

Specially adapted for weighing long, bulky products, such as hides and light bar iron or other materials which hang over the sides of the scale. It is made with large wheels which makes the platform from 15 to 17 inches above floor. The front axle is mounted on a fifth wheel and equipped with wrought iron handle so the scale can be easily turned in a small space. Fitted with brass arrow-tip single beam, with sliding poise and set screw; also with index counterpoise, which shows the value of the loose weights which is read directly from the counterpoise stem. Finished in blue and gold.

NOS.	Capacity, Lbs.	Beam, Lbs.	Platform, Inches	Height Platform, Inches	Each
1184	2,500	100x½	25x34	17	$120.00
1186	2,000	100x½	25x32	17	110.00
1188	1,500	100x½	22x31	16	90.00
1192	1,000	100x½	18x27	15	65.00

HEAVY PATTERN, WITH DROP LEVER

This scale is made especially heavy and strong for service in foundry, factory or mill, to weigh heavy loads with accuracy.

To relieve the mechanism from the jar and shock of loading and unloading, a drop lever is provided.

The wheels are unusually large, 12 inches in diameter, making the platform a height most convenient for loading and unloading heavy materials. The pillar is strengthened by an iron brace.

The beam is of the arrow-tip pattern, of brass with brass poise and set-screw. Finished in blue and gold.

NO.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1206	4,000	100x½	31x39	$140.00

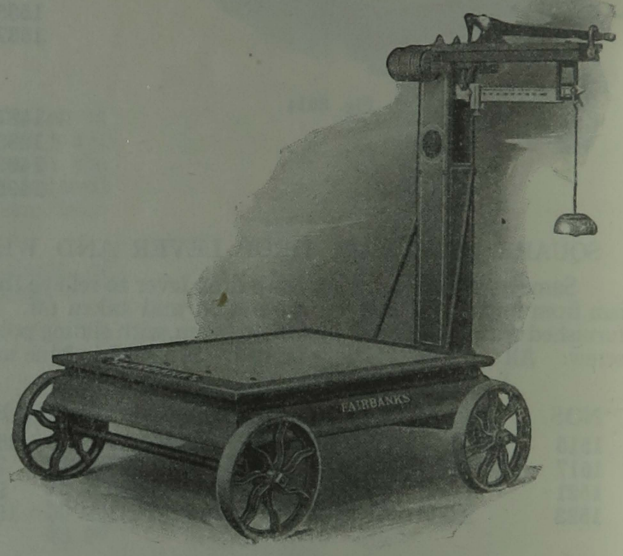


Fig. 3218

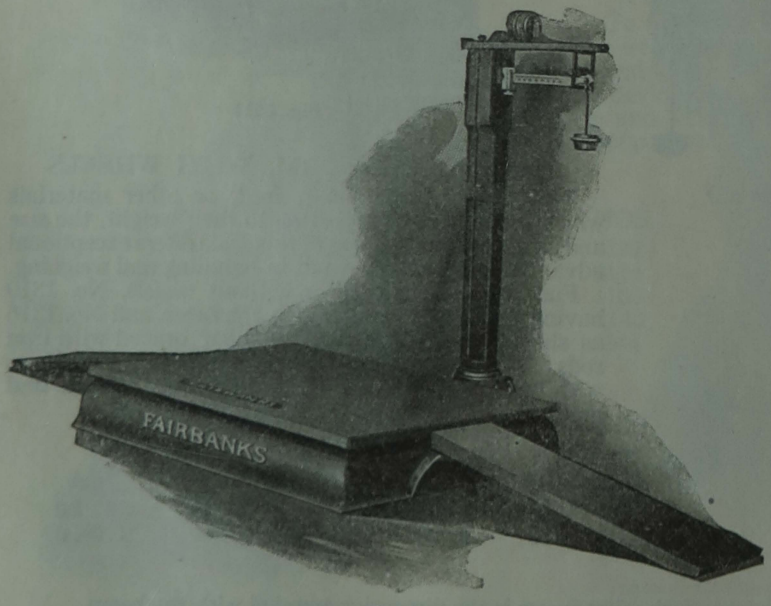


Fig. 3219

This scale is strongly built of metal throughout, adapted for weighing wheelbarrow loads or for general use in the metal, fertilizer or similar trades. A bracket is cast on each end of the frame to form a rest for an incline, so that a wheelbarrow load may be easily run on the platform. A set of two wooden inclines is furnished regularly with the scale without extra charge.

All Metal with Incline Brackets, without Wheels

NOS.	Capacity, Lbs.	Size Platform, Inches	Each
1382	1,000x1	42x30	$95.00
1389	2,000x1	44x35	120.00

All Metal with Incline Brackets and Wheels

1384	1,000x1	42x30	$100.00
1390	2,000x1	44x35	125.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

PORTABLE PLATFORM SCALES

Fig. 3220

WITH RACK PLATFORM, WITH OR WITHOUT DROP LEVER

For convenient weighing under severe service, this strong, heavy scale is provided with an extra iron-covered wood platform with iron racks. Large rubber cushions are placed between the two platforms to absorb the shock and strain of loading and unloading, and a drop lever mechanism may also be provided to further protect the levers and bearings from wear. Large, solid, reinforced web wheels are used, bringing the platform high so that overhanging loads will clear the ground. A fifth wheel construction with convenient handle allows scale to be easily turned in small space. The arrow-tip beam is single, of brass with set-screw poise.

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Height of Platform, Inches	Each
1416	2,500	100x½	25x32	24	$190.00
1420	6,000	200x1	31x40	27	280.00
1424	10,000	200x1	31x40	31	300.00
		With Rack Platform and Drop Lever			
1428	2,500	100x½	25x32	24	190.00

WITH SHORT IRON PILLAR AND RACK PLATFORM

With short pillar which brings the beam and weights below the rack platform, so that large bars or castings may be passed over the top of the scale without interference. Of heavy, strong construction with iron-covered rack platform resting on rubber cushions to absorb the strain of loading and unloading.

The fifth wheel construction at the beam end, with the convenient handle, allows the scale to be easily handled and turned in a small space. The single, brass arrow-tip beam with set-screw poise is supported from pillar and cap of iron. Finished in black.

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Height of Platform, Inches	Each
1464	2,500	100x½	25x32	24	$190.00
1468	6,000	200x1	31x40	27	280.00
1472	10,000	200x1	31x40	31	300.00

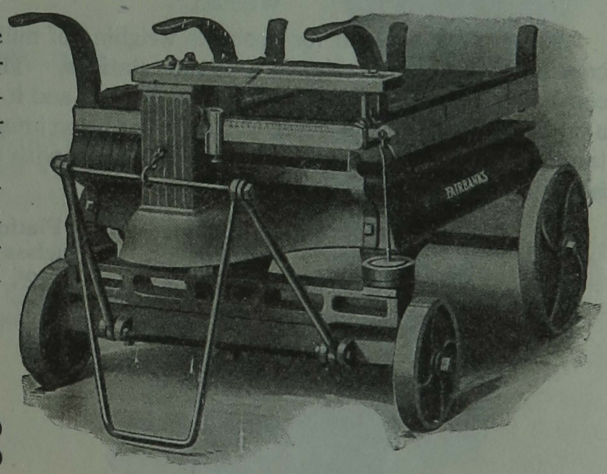


Fig. 3221

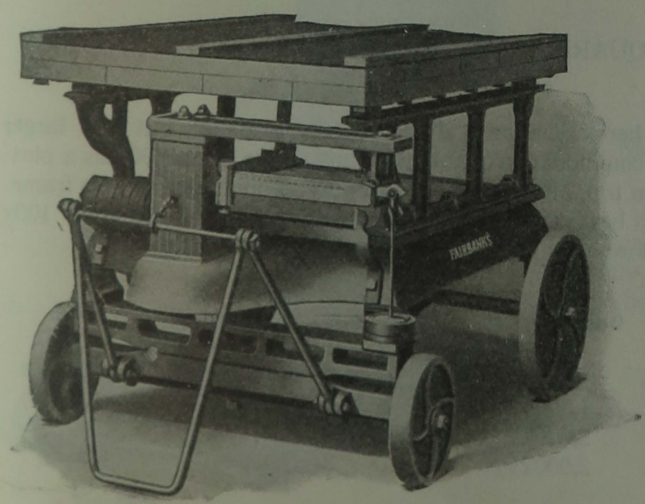


Fig. 3222

WITH SHORT IRON PILLAR AND RAISED PLATFORM

This scale has the platform raised above the short iron pillar and beam, so that bars or sheets may be passed over the scale without interference. The iron-covered platform is flat, with metal strips especially adapted to hold sheet metal, and its height prevents any overhanging load from touching the ground.

The single beam is of the arrow-tip pattern, of brass with brass set-screw poise, the entire scale being durably finished in black and well varnished.

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Height of Platform, Ft.	Height of Platform, In.	Each
1492	6,000	200x1	33x50	3	3	$300.00
1496	10,000	200x1	33x50	3	6	350.00

Note.—In the platform size above, the first figure is the dimension parallel with the beam.

DAIRY PRODUCTS SCALES

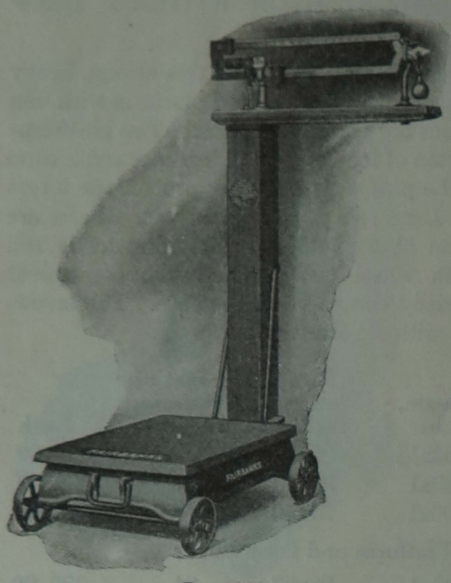


Fig. 3223

PORTABLE PLATFORM SCALE WITH AGATE BEAM BEARING

This scale is built to weigh tubs of butter, salt or other loads, being fitted with a solid iron platform, with beveled edges overhanging the frame so as to aid in protecting the mechanism from contact with moisture or salt. Nickel-plated arrow-tip double beam with both bars notched and fitted with set-screw poises. The upper bar is graduated 100x½ lbs. and lower bar, 125x1 lbs., a bottle weight with an effective value of 200 lbs., making up full capacity.

For churnroom use, the lower bar is graduated 100x½ lbs., and upper bar 12x¼ lbs. Furnished either plain or galvanized.

NOS.	Description	Capacity, Lbs.	Size Platform, Inches	Each
1249 Regular	Plain	425x½	16x25	**$59.00**
11340 Regular	Galvanized	425x½	16x25	**74.00**
11341 Churnroom	Plain	412x¼	16x25	**59.00**
11342 Churnroom	Galvanized	412x¼	16x25	**74.00**

PORTABLE PLATFORM SCALE WITH DOUBLE BEAM AND WHEELS

This scale is adapted for accurate weighing of milk and cream for creameries, cheese factories or receiving stations. The platform is of convenient size to accommodate one or more cans and it is equipped with a brass arrow-tip double beam, the lower bar being intended to take the tare of the cans. The poise on this bar is fitted with set-screw. **Finished** in **black** and **gold.**

NOS.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1278	500x½	100x½	16x25	**$41.00**
1280	1000x½	100x½	18x27	**53.00**

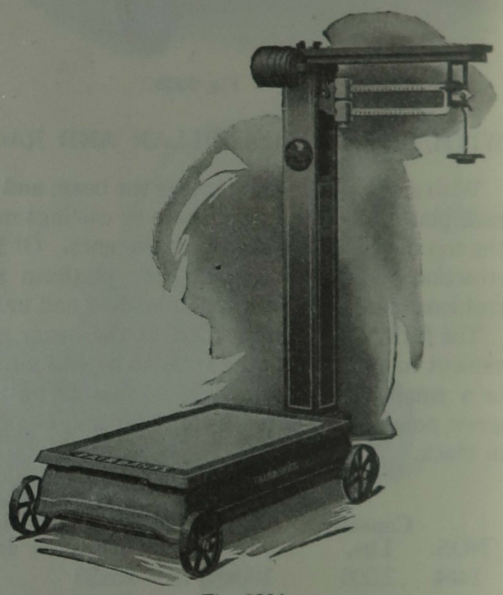


Fig. 3224

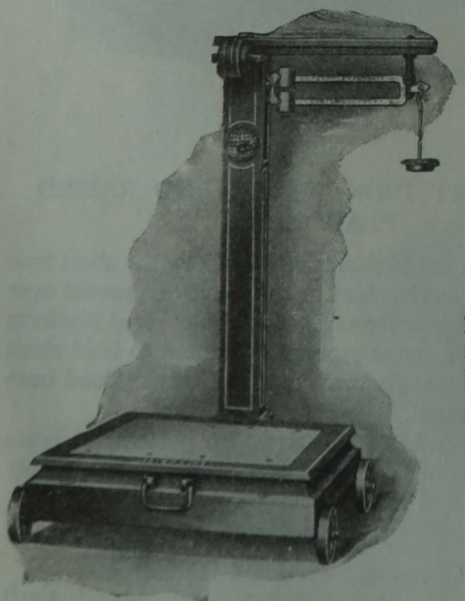


Fig. 3225

PORTABLE SQUARE PLATFORM SCALE WITH WHEELS AND DOUBLE BEAM

The scale shown here is similar in all respects to the above; but with larger platform area to accommodate a quantity of cans. The No. 10690 has a platform with solid iron top, all the others having wood panels set in iron frame. It is equipped with brass arrow-tip double beam, both bars graduated 100x ½ lbs. Poise on lower bar fitted with set-screw.

NOS.	Capacity, Lbs.	Size Platform, Inches	Each
10685	500x½	23x23	**$60.00**
10686	1,000x½	25x25	**77.00**
10688	1,500x½	29x29	**98.00**
10689	2,000x½	31x31	**128.00**
10690	2,000x½	34x34	**143.00**

Note.—In the platform sizes above, the **first** figure is the dimension parallel with the beam.

DAIRY PRODUCTS SCALES

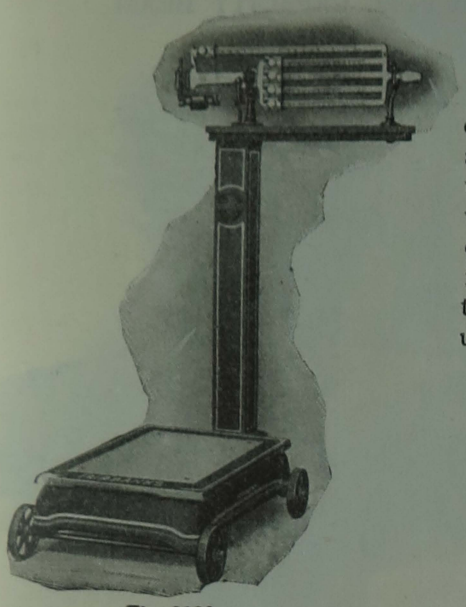


Fig. 3226

PORTABLE PLATFORM SCALE WITH FIVE AND SEVEN-BAR BEAM AND WHEELS

For weighing milk or cream as it is delivered by the producer to the creamery, condenser or cheese factory, this scale offers exceptional convenience and a marked saving in time. For this purpose, it is customary for the purchaser to furnish a tank, which is placed on the platform. It is furnished with a beam with five or seven bars. Thus the milk or cream from five or seven producers can be deposited in the tank and recorded on the separate beams. The beam is of brass and has set screws in all poises. The five-bar beam is graduated: top bar, 220x1Lb.; four lower bars, 100x½ Lb. The seven-bar beam is graduated: top bar, 210x1; second bar, 320x1; remaining five bars, 100x½ Lb.

With Five-Bar Beam

NO.	Description	Capacity, Lbs.	Size Platform, Inches	Each
1286	With Wheels	600x½	16x25	$72.00

With Seven-Bar Beam

NO.	Description	Capacity, Lbs.	Size Platform, Inches	Each
1288	With Wheels	1000x½	18x27	$85.00

ALL METAL PORTABLE PLATFORM SCALE WITH FIVE-BAR BEAM AND WHEELS

This scale is similar to the five-bar beam scale described above, but it is constructed entirely of metal with large platform. It may be used with a tank, or a number of milk cans can be placed on the platform at one time.

NO.	Description	Capacity, Lbs.	Size Platform, Inches	Each
1443	5-bar beam	600x½	27x23	$90.00

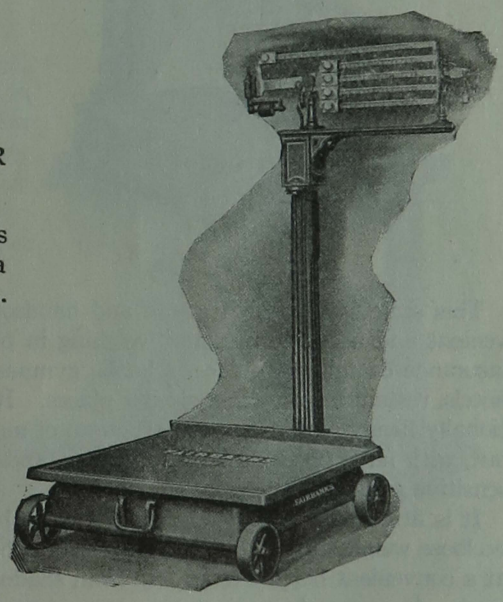


Fig. 3227

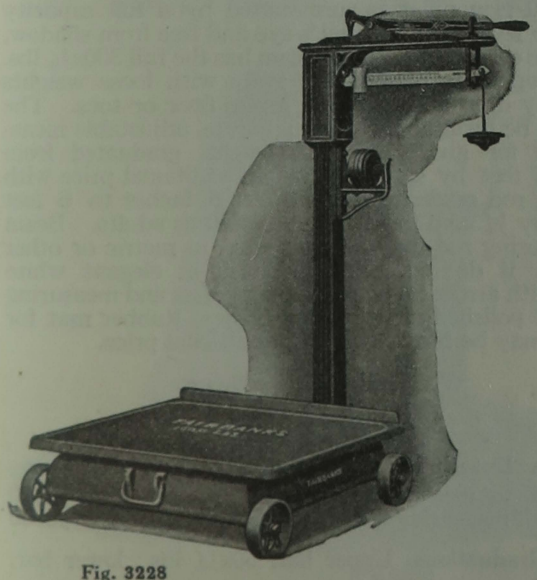


Fig. 3228

ALL METAL PORTABLE PLATFORM SCALE WITH DROP LEVER AND WHEELS

A heavy durable scale for the creamery or cheese factory, built entirely of metal with large platform and drop lever, equipped with single brass arrow tip beam, graduated 100x½ Lb.

NO.	Capacity, Lbs.	Beam, Lbs.	Size Platform, Inches	Each
1449	1000x½	100x½	30x30	$85.00

Note.—In the platform sizes above, the **first** figure is the dimension parallel with the beam.

PERSONAL SCALES
WITH FULL CAPACITY BEAM

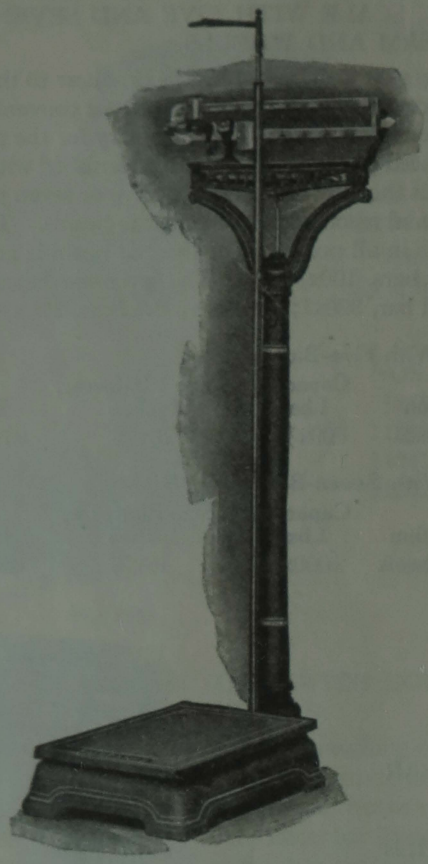


Fig. 3229

This scale is very high grade and handsome, for convenient and accurate personal weighing in physicians' or insurance examiners' offices, schools, gymnasiums, clubs, hotels, restaurants or other similar places. It is of exceptionally heavy and strong construction, of metal throughout, with large platform and iron pillar, and is extremely sensitive and reliable.

It is fitted with a full capacity arrow-tip beam, having no loose weights to be dropped on toes or floor, and placed at a convenient height, to be free from shadow and easily read. An accurate, adjustable measuring rod may be furnished, fitted to the scale. This rod is graduated from 2 feet 6 inches to 6 feet 6 inches by ¼ inch, to give the height of children as well as of adults, and has flat-tipped folding head-piece. The beam and measuring rod may be graduated to metric or other standards, if desired.

The scale is regularly finished in black and bronze with polished brass beam, poises and measuring rod, but may also be finished in white enamel with the brass parts nickel-plated at an additional price of $6.00.

With Full Capacity Beam

NOS.	Description	Capacity, Lbs.	Size Platform, Inches	Each
1255	Without measuring rod	300x¼	13½x19½	$46.00
1257	With measuring rod	300x¼	13½x19½	66.00

Beam Graduations: Upper bar, 50x¼ lbs.; lower bar, 250x50 lbs.

Measuring Rod: 2 feet 6 inches, to 6 feet 6 inches by ¼ inch graduations.

Height: Floor to tip of beam, 52½ inches.

PERSONAL SCALES
WITH FULL CAPACITY BEAM

Fig. 3230

The value of closely noting and following the continual changes in personal weight is today universally recognized by physicians, physical culturists and everyone interested in attaining and maintaining health. Every change in weight is the result of some physical condition—it may show the desired effects of beneficial treatment; it may point out the necessity for new or different treatment.

The tall iron pillar is surmounted by a full capacity beam on a level with the user's eye and free from shadow, so as to be easily read. This beam has the full 300x¼ lbs. capacity upon its bars, doing away with loose weights which may drop and break or injure floor or toes. The scale may be furnished with an accurate, adjustable measuring rod for giving personal height, graduated from 4 feet to 7 feet by ¼ inch, or at an additional price with measuring rod graduated from 2 feet 6 inches to 6 feet 6 inches by ¼ inch for children as well as adults. Beam and measuring rod may be graduated to metric or other standards, if desired. The finish is in elegant white enamel, with arrow-tip beam, sliding poises and measuring rod, all of polished nickel-plated brass. Rubber mat for platform may be furnished at an additional price.

With Full Capacity Beam

NOS.	Description	Size Capacity, Inches	Size Platform, Inches	Each
1263	Without measuring rod	300x¼	10½x14½	$36.00
1265	With measuring rod	300x¼	10½x14½	48.00

Beam Graduations: Upper bar, 50x¼ lbs.; lower bar, 250x50 lbs.

Measuring Rod: 4 feet to 7 feet by ¼ inch.

Height: Floor to tip of beam, 58½ inches.

WAREHOUSE SCALES

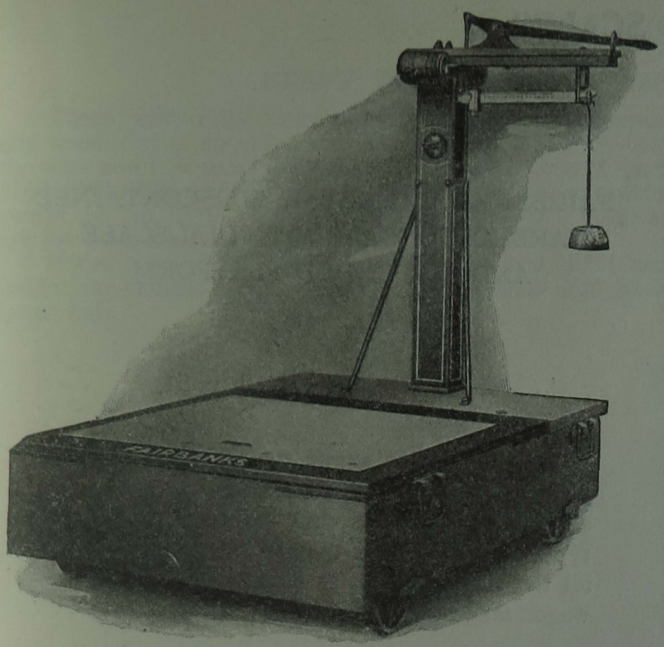


Fig. 3231

SELF-CONTAINED PORTABLE, SINGLE WOOD PILLAR AND DROP LEVER

A very rugged portable scale with large platform for weighing heavy, bulky loads for warehouse, factory or similar service, equipped with wheels and drop lever. Has single brass arrow tip beam, graduated 100x½ lb. with brass sliding poise and set screw.

NOS.	Capacity, Lbs.	Size Platform, Inches	Platform to Beam Support, Inches	Each
1018	5000x½	48x49	23	$200.00
1020	3500x½	42x44	12½	160.00
1022	2500x½	47x37	12	140.00

SELF-CONTAINED SCALE

One of the most popular types of self-contained scales for installation, flushed with floor for weighing heavy, bulky merchandise on trucks, grain in sacks or for similar service. Regularly furnished with double brass arrow tip beam with sliding poises. Poise on lower bar is fitted with brass set screw. Also has an index counterpoise. Beams on all scales except Nos. 995 and 1077 graduated 100x½ lb. on upper bar and 200x1 lb. on lower. On No. 995 upper bar, 100x1 lb.; lower bar 200x1 lb. On No. 1077 upper bar, 120x½ lb.; lower bar, 150x1 lb.

NOS.	Capacity, Lbs.	Size Platform, Inches	Platform to Beam Support, Inches	Each with D. B.
995	6000x1	60x54	21	$280.00
1035	5000x½	48x49	23	200.00
1039	3500x½	42x44	12½	150.00
1053	3500x½	42x44	20	170.00
1041	2500x½	47x37	12	135.00
1043	1500x½	43x33	15½	130.00
1077	2500x½	39x47	12	145.00

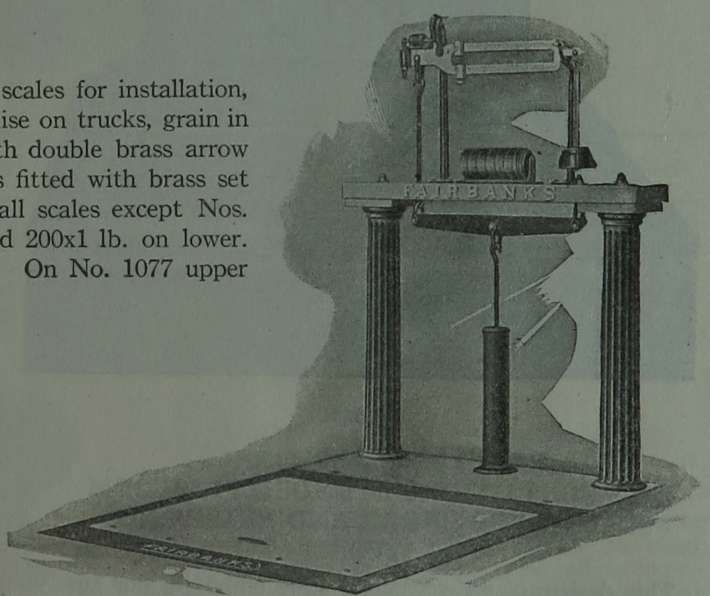


Fig. 3232

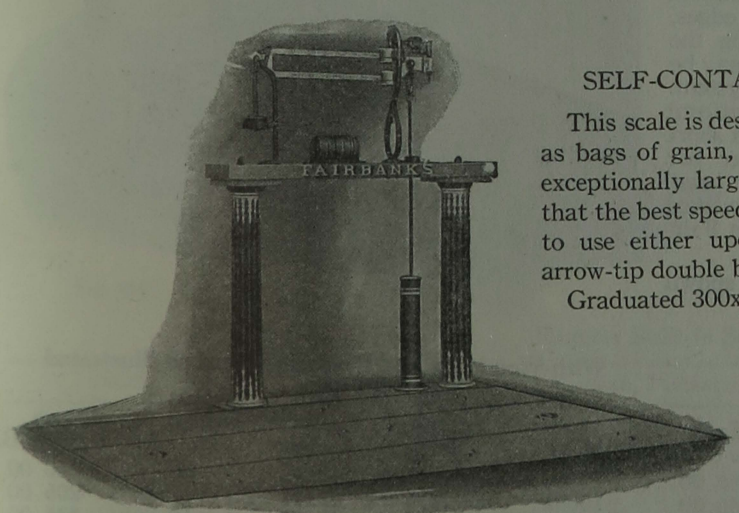


Fig. 3233

SELF-CONTAINED SCALE WITH LARGE PLATFORM

This scale is designed to weigh bulky merchandise in quantity, such as bags of grain, coffee and similar material. The platform being exceptionally large, the load should be evenly distributed thereon so that the best speed and accuracy may be obtained. It is self-contained to use either upon the floor or flush with the floor. Fitted with arrow-tip double beam.

Graduated 300x1 lb. on each bar and is of brass with brass set-screw poise on lower bar for taking tare and plain poise on upper bar.

NO.	Capacity, Lbs.	Size Platform, Inches	Platform to Beam Support, Inch	Each with D. B.
1082	3500x1	76x52	1	$200.00

Note.—In the platform sizes above, the **first** figure is the dimension parallel with the beam.

WAREHOUSE SCALES

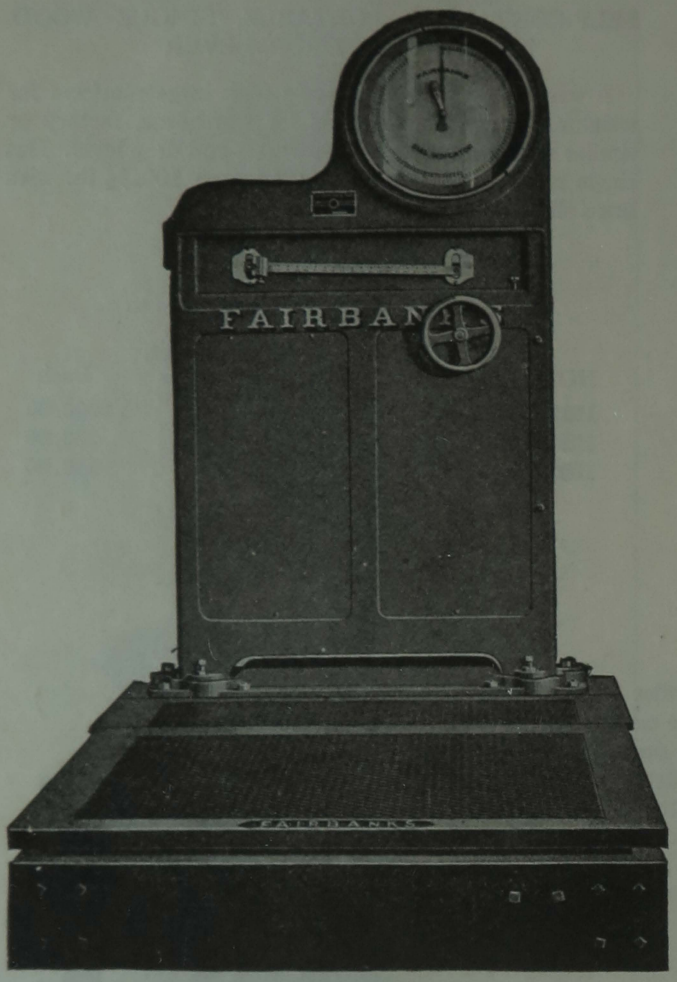


Fig. 3234

FAIRBANKS ALL METAL SELF-CONTAINED WAREHOUSE SCALE WITH DIAL SCALE AND SUSPENDED PLATFORM

This illustration shows the all metal suspended platform self-contained warehouse scale with springless dial indicator. This type of dial can be applied to practically all the stationary scales illustrated, also to wagon and auto truck scales.

Complete information will be gladly furnished upon request.

SELF-CONTAINED SUSPENDED PLATFORM SCALE WITH SPIDER AND REMOVABLE PLATFORM

This design of self-contained scale embodies our suspended bearing feature by means of which the platform is suspended and not imposed upon the main knife edges, insuring all motion being absorbed before reaching the knife edges. The platform rests upon a spider and may be easily lifted for cleaning or inspecting the lever system. It is designed for installation in the floor with platform flush with the floor level. Regularly furnished with short iron pillar outfit and double arrow-tip beam, upper bar graduated 200x½ lb., lower bar 200x1 lb., with brass poises and index counterpoise. It can also be furnished with full capacity or type registering beam or with Fairbanks dial.

It is made with wood box and platform board as shown and also of all metal construction.

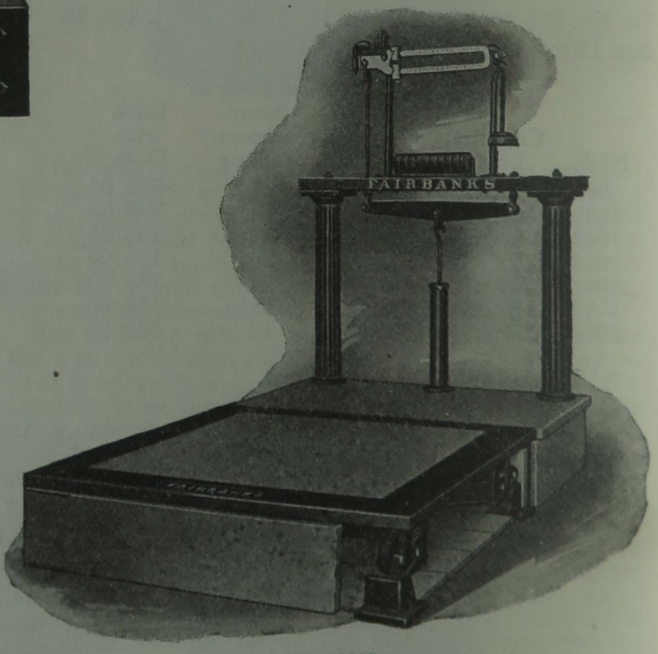


Fig. 3235

All Metal Construction

NOS.	Capacity, Lbs.	Size Platform, Inches	Platform to Beam Rod, Inches	Each with D. B.
10694	5000	48x49	23	$412.00
10695	3500	42x44	12	385.00
10696	2500	47x37	12	335.00

With Wood Box and Platform Board as Illustrated

NOS.	Capacity, Lbs.	Size Platform, Inches	Platform to Beam Support, Inches	Each with D. B.
10080	5000x½	48x49	23	$250.00
10081	3500x½	42x44	12	205.00
10082	2500x½	47x37	12	185.00
10083	1500x½	43x34	13	170.00

Note.—In the platform size above, the first figure is the dimension parallel with the beam.

WAREHOUSE SCALES

HEAVY DUTY, BUILT-IN, SUSPENDED PLATFORM SCALE

These heavy duty scales are of the improved suspended platform construction and are designed for setting into any wood, dirt or concrete floor, the suspended bearing feature protecting the knife edges from all shocks and reducing the wear and tear to a minimum. Scales are regularly furnished with double brass arrow-tip beam. Scales Nos. 2185, 2153, 2171, 2175 and 2179, are regularly furnished complete with timber, both bars of beam being graduated 200x1 lb.; except the No. 2179 which is graduated 500x1 lb. These scales are particularly adapted for factory and warehouse use for weighing high priced materials of all kinds.

Scales Nos. 10099, 10100, 10101, 11186 and 10771 are furnished **without timber** and are especially adapted for freight and express depots. Beams for these scales are graduated 1000x2½ lbs. on the upper bar and 2000x5 lbs. on the lower bar.

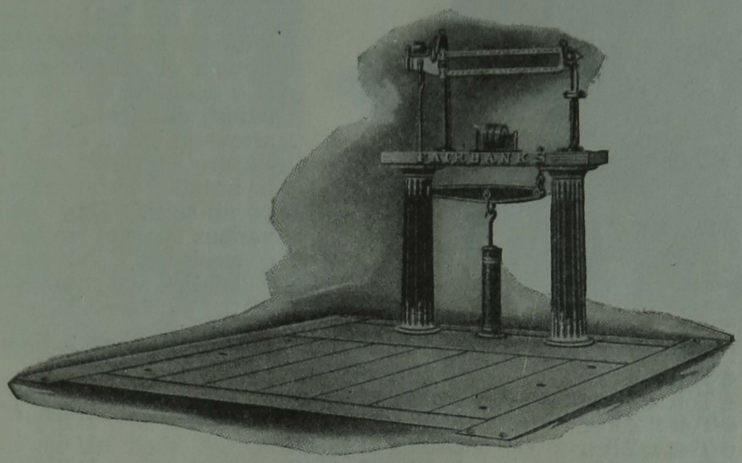


Fig. 3236

Framed Complete With Hardwood Timber

NOS.	Capacity	Size Platform	Platform to Beam Rod	Each
2185	4 T.x1 lb.	5′x4′6″	2′6″	$400.00
2153	4 T.x1 lb.	6′x4′8″	1′5¾″	400.00
2171	6 T.x1 lb.	6′x3′5″	1′7″	450.00
2175	6 T.x1 lb.	6′x4′8″	1′5¾″	500.00
2179	10 T. x1lb.	6′x4′8″	1′5¾″	600.00

Scales Only—Without Timber

NOS.	Capacity, Tons	Size Platform	Plat. to Beam Rod	Each
10099	4	6′x4′	27¾″	$295.00
10100	5	8′x6′	24¾″	310.00
10101	5	9′x7′	23¼″	325.00
11186	4 (A.R.A. rating)	6′x5′	3′0″	380.00
10771	5 (A.R.A. rating)	10′x5′3″	2′4 3/16″	485.00

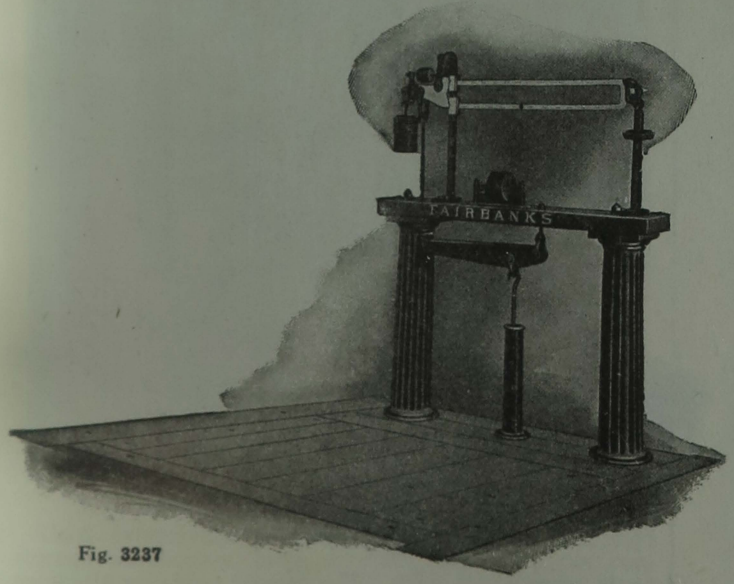


Fig. 3237

REGULAR BUILT-IN SCALE

For weighing freight and baggage in depot or on dock, or for general warehouse service to weigh heavy, bulky merchandise, this scale offers exceptional advantage. It is of strong construction with large platform, designed to be built directly into any wood, dirt or concrete floor. The lever system is of regular arrangement and composed of four levers of the trussed pattern, insuring against deflection.

Regularly fitted with arrow-tip double beam of brass, graduated 500 by 2 pounds on both bars. Scale parts only are supplied, all foundations and structural materials being furnished by the purchaser.

Regular Built-in Scale

NOS.	Capacity, Tons	Size, Platform	Platform to Beam Rod	Each
11334	4	6′ 0″x 3′ 10″	1′ 1⅞″	$200.00
11335	4	6′ 0″x 4′ 11¼″	1′ 6⅝″	210.00
11336	6	6′ 0″x 4′ 11¼″	1′ 6⅝″	235.00
11337	6	8′ 0″x 6′ ⅝″	1′ 6¼″	245.00
11346	6	9′ 0″x 6′ 11″	2′ 7½″	250.00
11338	10	6′ 0″x 4′ 11¼″	1′ 6⅝″	290.00
11339	10	8′ 0″x 6′ ⅝″	1′ 6¼″	300.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

METAL TRADES AND MINING SCALES

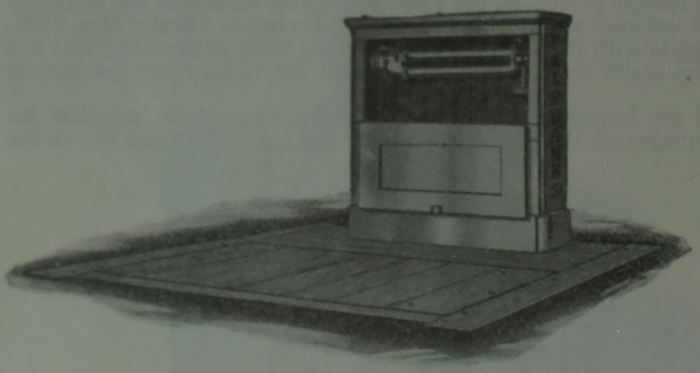


Fig. 3238

BUILT-IN SCALES

Commonly known as miners' and transportation or industrial railway scales. Designed to set directly into the ground or floor with loads applied by truck or car. Strongly built with heavy parts for weighing coal, ore, metal and other heavy materials and to withstand effects of shock due to loading and unloading. A practical and efficient scale for mine, dock terminal, industrial plant or boiler room.

Scale No. 2294 is commonly used for industrial railways for boiler rooms, being adapted on a 24-inch or smaller gauge. Other scales listed are also designed for use with narrow gauge track or industrial railways. Furnished with double brass arrow-tip beam, each bar graduated 500x2 pounds. Illustration shows scale installed of wood, but may be installed with combination of steel and wood or of all steel. They may also be furnished with various types of equipment for special purposes or convenience. Scale parts only are supplied by us, foundation and structural material being furnished by the purchaser.

NOS.	Capacity	Platform	Platform to Beam Rod	Each
2294	4 Ton x 2 lbs.	5′ 1″ x 30″	2′ 5″	$150.00
11344	4 Ton x 2 lbs.	6′ 0″ x 3′ 10 ″	1′ 1⅞″	150.00
11343	4 Ton x 2 lbs.	6′ 0″ x 4′ 11¼″	1′ 6⅝″	160.00
11198	6 Ton x 2 lbs.	6′ 0″ x 4′ 11¼″	1′ 6⅝″	185.00
2074	6 Ton x 2 lbs.	8′ 0″ x 6′ 0⅝″	1′ 6¼″	195.00
11345	6 Ton x 2 lbs.	9′ 0″ x 6′ 11 ″	2′ 7½″	200.00
11199	10 Ton x 2 lbs.	6′ 0″ x 4′ 11¼″	1′ 6⅝″	240.00
2070	10 Ton x 2 lbs.	8′ 0″ x 6′ 0⅝″	1′ 6¼″	250.00

FURNACE CHARGING SCALES

SELF-CONTAINED, WITH SELF-LOCKING POISE BEAMS

These scales are of the regular self-contained all metal pattern fitted with self-locking poise charging beam outfit and are designed for weighing several different materials used in furnace charging. They may also be furnished with our patented removable beam outfits.

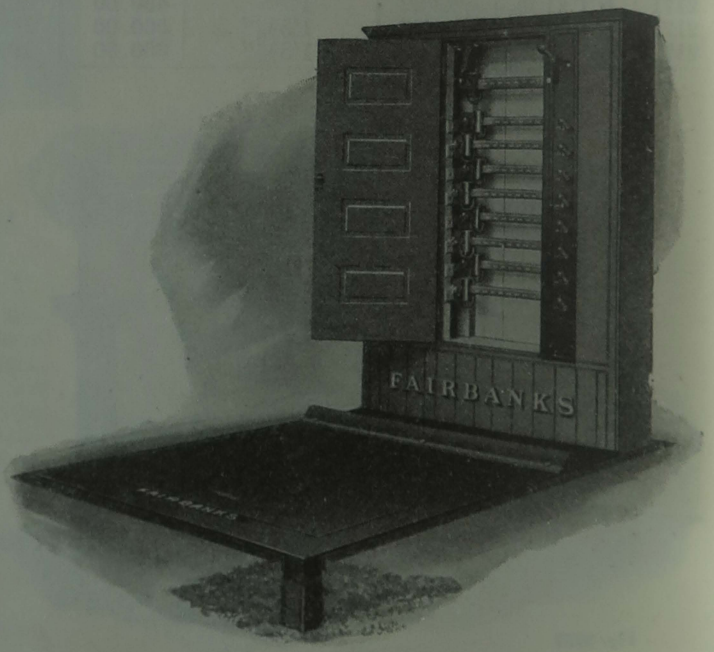


Fig. 3239

Furnace Charging Scale — Self-Contained with Self-Locking Poise Beams

NOS.	No. of Beams	Capacity of Each Beam, Lbs.	Platform Size	Platform to Beam Support	Each
1645	6	1500 x 5	50″ x 50″	22″	$450.00
1649	8	1500 x 5	50″ x 50″	22″	500.00

All Metal Self-Contained Scales with Removable Beams, All Metal Outfits

NOS.	No. of Beams	Capacity of Each Beam	Platform Size	Platform to Beam Support	Each
11416	6	1600 lbs. x 5 lbs.	50″ x 50″	22″	$500.00
11418	8	1600 lbs. x 5 lbs.	50″ x 50″	22″	550.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

PACKING HOUSE AND MARKET SCALES

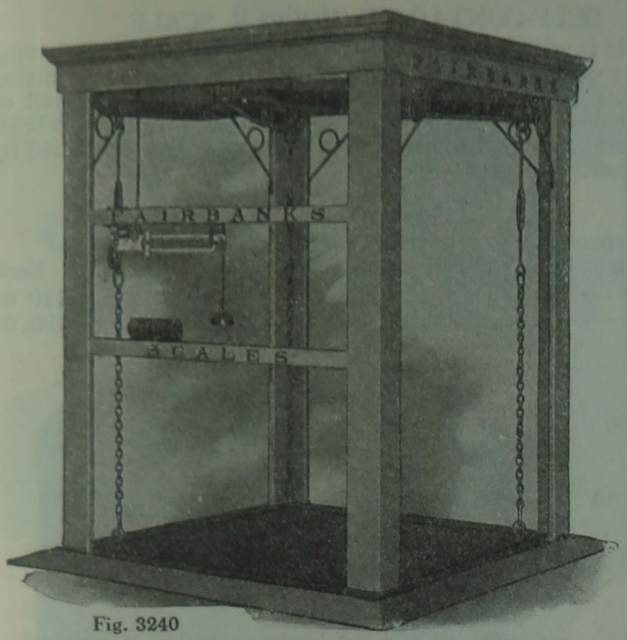


Fig. 3240

FRAMED SUSPENSION SCALE WITH IRON PLATFORM AND CHAINS

Adapted for setting up on the floor, for convenient trucking of loads onto the platform by means of wood curbing. Where located on concrete flooring, this construction does away with the necessity of cutting a hole in the floor. The removal of the curbing around the platform allows of flushing the floor directly underneath.

NO.	Capacity, Lbs.	Size Platform	Ht. Plat. Above Floor	Each
10620	4000x½	5′ 0″ x 5′ 1″	2″	$350.00

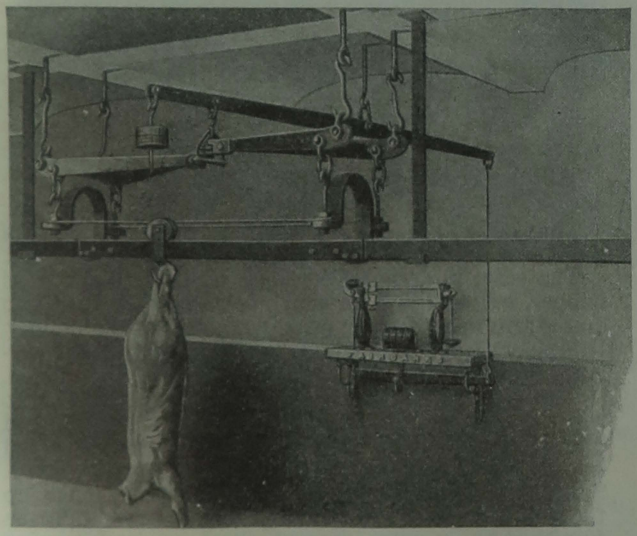


Fig. 3241

OVERHEAD TRACK SCALES

Used extensively in abattoirs, packing houses, cold storage warehouses, large markets and hotels for conveniently weighing dressed meat, while it is passing along on an overhead rail. The beam may be placed in a separate room. Scales designed for T-rail, I-beam, Coburn, Louden, or other rails.

NOS.	Capacity, Lbs.	Length of Track	Top of Track to Ceiling, Inches	Each
1650	2000x½	4′ 0″	23	$150.00
1654	3000x½	6′ 0″	23	175.00
1670	1500x½	4′ 2″	23	150.00
1680	1500x½	4′ 2″	10	175.00

Note.—In the platform sizes above, the first figure is the dimension parallel with the beam.

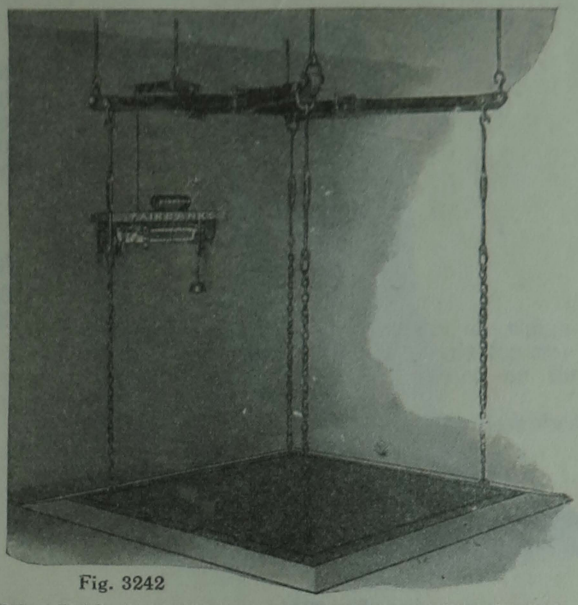


Fig. 3242

CEILING SUSPENSION SCALE WITH IRON PLATFORM

This scale being suspended directly from the ceiling or timbers, no corner posts are necessary and connection is made to the beam fastened to a wall near the scale. Has the advantage of overhead mechanism, away from the effects of corrosion due to salt and moisture from meat, fish or other similar products on the platform below. There is no need to cut a hole in the floor. Wood curbing is placed around the platform for easy loading, and when removed, permits of flushing the floor beneath platform.

NO.	Capacity, Lbs.	Size Platform	Ht. Plat. Above Floor, Inches	Each
10621	4000x½	5′ 0″ x 5′ 1″	2	$230.00

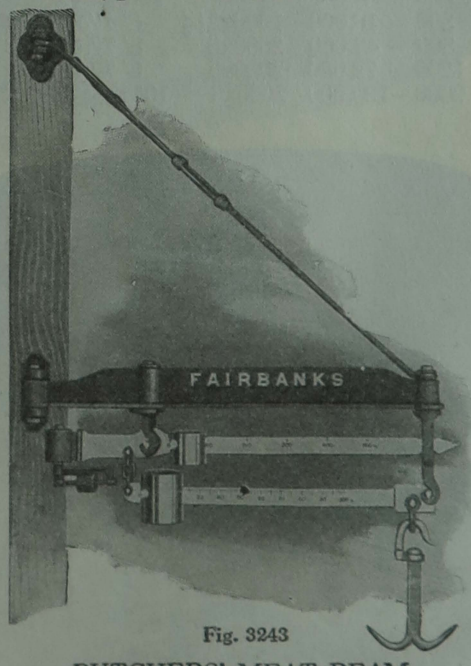


Fig. 3243

BUTCHERS' MEAT BEAM

Adapted for use in retail butcher shop or market, for checking the weight of incoming sides or quarters of meat from the wholesale delivery.

NO.	Capacity, Lbs.	Each
451	600 x ½	$64.00

GRAIN AND FLOUR SCALES

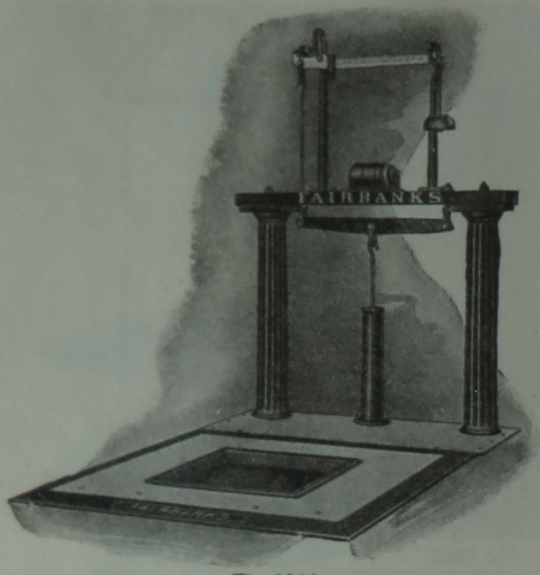


Fig. 3244

SHALLOW PATTERN FOR STEEL FRAME AND STEEL HOPPER OR WOOD FRAME AND WOOD HOPPER

This scale is illustrated with steel frame and steel hopper and offers a strong, durable fire-proof construction; is also furnished for wood frame and wood hopper. Adapted for quick, accurate weighing of grain in bulk for elevator, mill or brewery, or as a tank scale in packing plant, soap factory, distillery, with tank flat cylindrical or cone-shaped. The floor supports for the lever system are supplied with the scale, but steel frame and steel hopper as well as wood frame and wood hopper are to be furnished by the purchaser.

NOS.	Capacity, Bu. Lbs.	Beam, Lbs.	Hop. Open	Each
1703S	300— 18,000	1000x2½	6′ 7″ sq.	$350.00
1715S	800— 48,000	2000x5	8′ 7″ sq.	600.00
1719S	1200— 72,000	2000x5	8′ 7″ sq.	800.00
10103S	2000—120,000	2000x5	10′ 11½″ sq.	1575.00

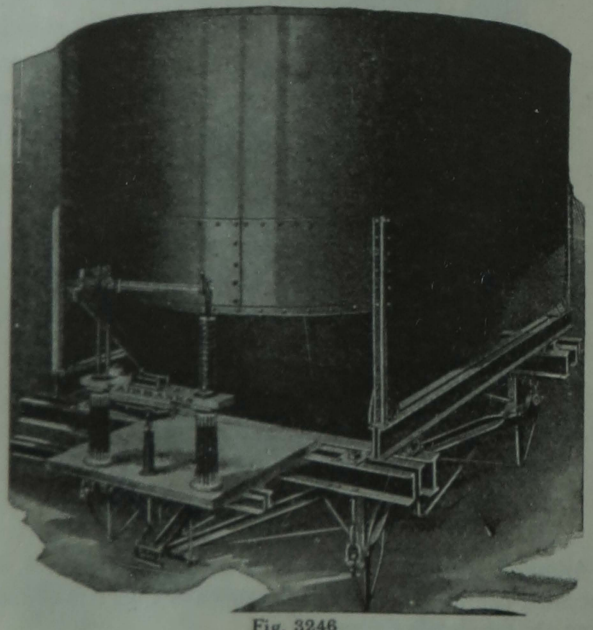


Fig. 3246

SELF-CONTAINED HOPPER SCALE

This scale is adapted for use in the country elevator for receiving and loading out grain, for checking wagon scale weights, for mixing and blending grain, or for use in small grain warehouse, mill or floating elevator. The arrow-tip beam is single, of brass with brass poise and set-screw. The hopper is in every case to be supplied by the purchaser.

NOS.	Capacity, Bu. Lbs.	Hopper Platform, Inches	Hopper Opening, Inches	Beam, Lbs.	Plat. to Bm. Supp.	Each
1608	60—3600x½	42x44	15x15	100x½	12½	$140.00
1612	100—6000x½	48x49	22x22	100x½	23	190.00

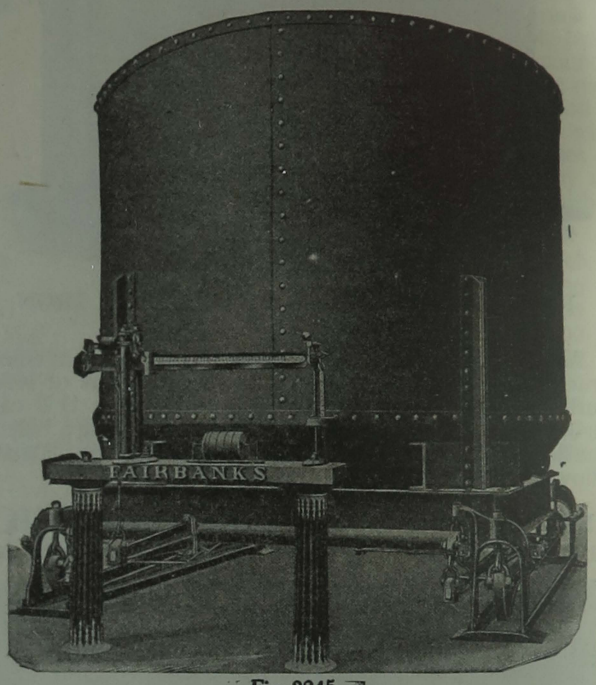


Fig. 3245

TRUSSED LEVER TYPE FOR STEEL FRAME AND STEEL HOPPER OR WOOD FRAME AND WOOD HOPPER

This scale is for use in weighing up to carloads of grain at a single draft in elevators, mills, breweries, etc.

The scale is designed for steel framework and steel hopper, well adapted for concrete fireproof installation and is also furnished for wood frame and wood hopper. It is heavy and strong throughout, with adjustable eye-bolts allowing readjustment for any settling out of level.

The single arrow-tip beam is regularly of steel, to resist deflection at these high capacities. It has inlaid brass face graduated 2000 x 5 lbs., and is supported by a short iron pillar outfit with wooden shelf. Suitable weights for an index counterpoise make up the full capacity. A type-registering beam may be furnished at an extra charge. Steel or wood framing and hopper to be supplied by the purchaser.

For Steel Frame and Steel Hopper

NOS.	Capacity, Bu. Lbs.	Hopper Opening	Each
1796	1200— 72,000x5	6′ 3″x 6′ 3″	$800.00
1733	2000—120,000x5	10′ 9″x 11′ 9″	1200.00
1727	2000—120,000x5	11′ 0″x 9′ 8″	1200.00
1729	2000—120,000x5	9′ 9″x 9′ 9″	1200.00
1745	2000—120,000x5	6′ 0″x 6′ 0½″	1200.00

For Wood Frame and Wood Hopper

NOS.	Capacity, Lbs.	Beam, Lbs.	Hop. Open.	Each
1752	300—18,000	1000x2½	3′ 8″x3′ 8″	$350.00
1772	800—48,000	2000x5	5′ 6″x5′ 6″	600.00

Note.—In the platform size above, the first figure is the dimension parallel with the beam.

AUTOMATIC GRAIN SCALES

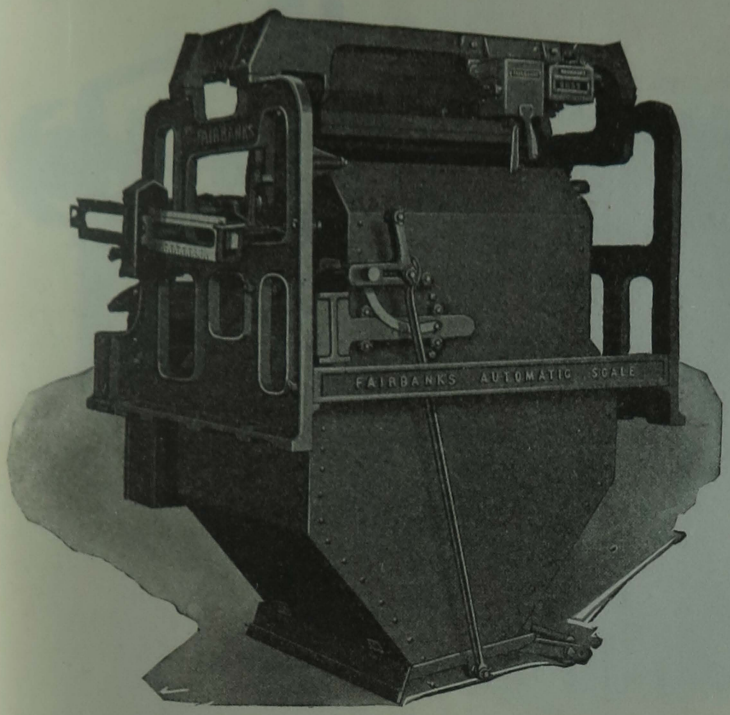


Fig. 3247

A complete line of automatic scales for weighing grain or other free flowing materials for continuous or intermittent elevator service or for bagging purposes.

Send for Catalog No. 895, which fully describes and illustrates this type of scale.

WAGON AND STOCK SCALES

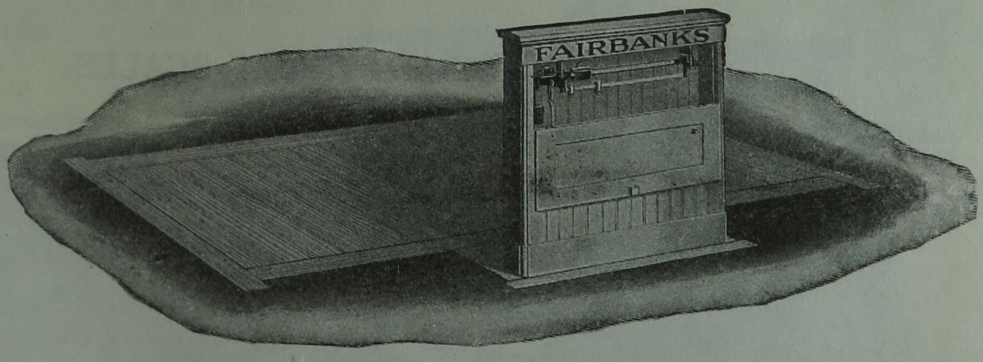


Fig. 3248

These scales are regularly furnished in a great variety of capacities and platform sizes, to cover all ordinary conditions of installation. On special order, however, they may be changed as required to suit special conditions, being readily fitted, for instance, with extension levers, so that the beam may be placed up to, say, twenty feet from the platform in an office or elsewhere.

All scales listed below may be furnished for either wood or steel framing. For outdoor weighing, a substantial wood beam box is usually specified, but for office use a short iron pillar outfit is preferable.

The scale as illustrated shows full capacity beam; but is regularly furnished with double beam, though it may be fitted with full capacity or type registering beam at an extra charge.

When scales are framed of wood, the lumber is furnished by the purchaser. When a steel frame is desired, the necessary steel work, punched and fitted, ready to assemble, is furnished by us at an extra charge. All foundations are supplied by purchaser.

NOS.	Capacity, Tons	Size, Platform	Edge of Platform to Beam Rod	Each
1934	5	14′ x 8′ 4¼″	2′ 1 ″	$180.00
2006	5	14′ x 7′ 2⅝″	1′ 11⅞″	180.00
2112	5	14′ x 8′	2′ 2½″	180.00
1846	6	18′ x 8′ 3″	4′ 5½″	210.00
2004	6	14′ x 7′ 2⅝″	1′ 11⅛″	210.00
2125	6	22′ x 8′ 4¾″	2′ 7⅝″	215.00
2110	6	14′ x 8′	2′ 2½″	210.00
1932	6	14′ x 8′ 4⅝″	2′ 1 ″	210.00
		16′ x 7′ 10 ″	1′ 11 ″	210.00
2100	6	22′ x 8′	2′ 9 ″	215.00
2101	6	22′ x 8′	2′ 9″	230.00
1842	10	18′ x 8′ 3 ″	4′ 5½″	260.00
1843	10	22′ x 7′ 2⅞″	3′ 9½″	270.00
1928	10	14′ x 8′ 4⅝″	2′ 0¾″	250.00
		16′ x 7′ 10 ″	1′ 11 ″	250.00
1829	10	22′ x 7′ 11 ″	3′ 1⅜″	265.00
1806	10	22′ x 10′ 4 ″	2′ 1 ″	270.00

Note.—In the platform size above, the first figure is the dimension parallel with the beam.

AUTO TRUCK SCALES

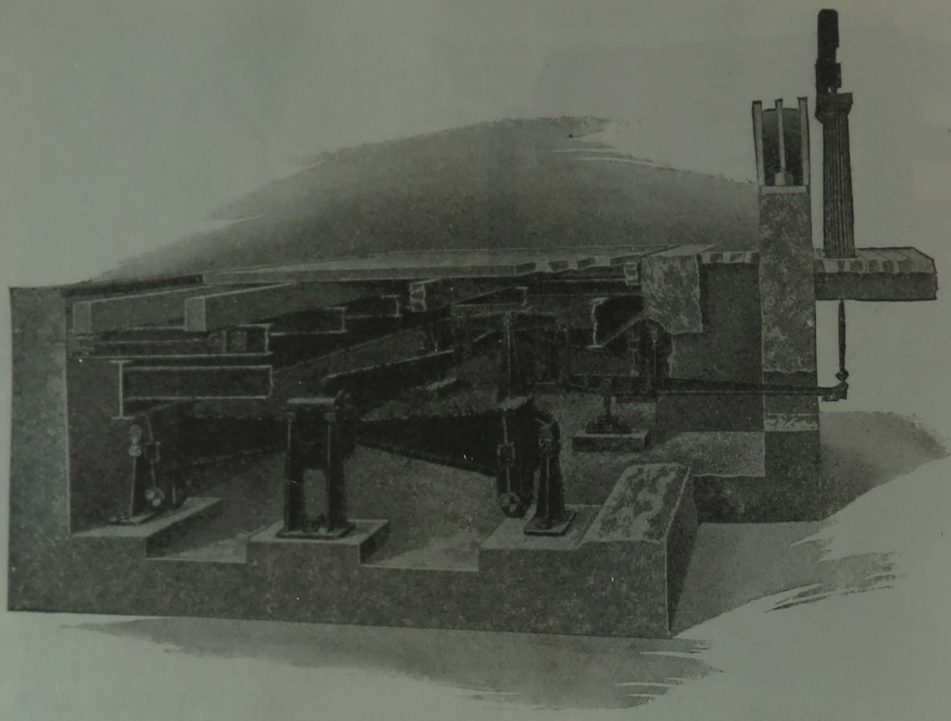


Fig. 3249

Furnished in several types and capacities.
Complete information on request.

RAILROAD TRACK SCALES

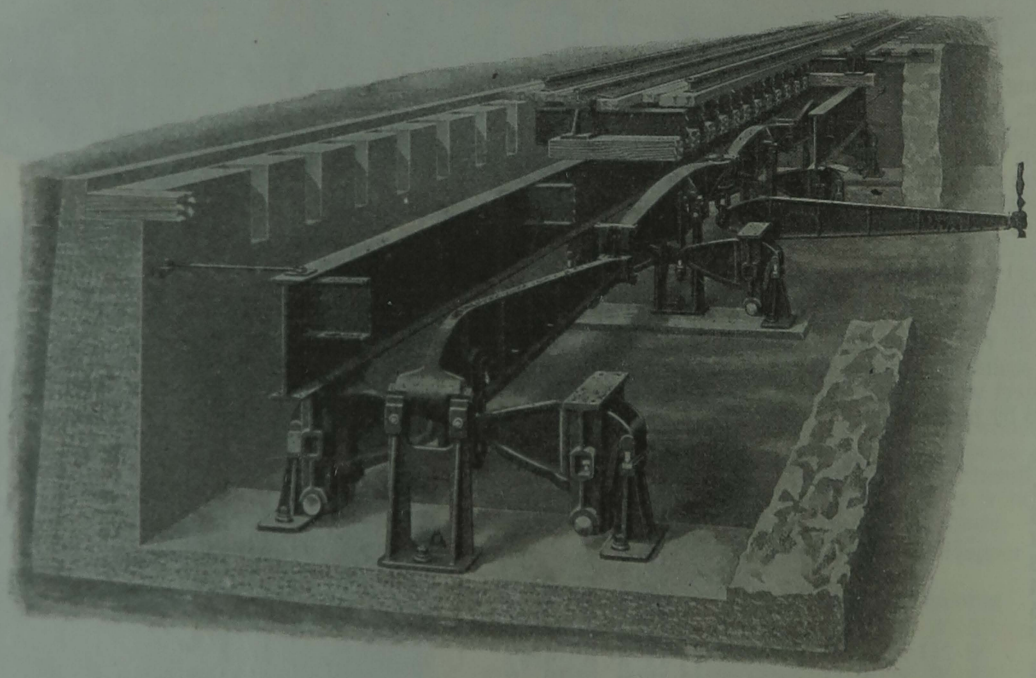


Fig. 3250

Type "P"—Four Section Suspended Platform Railroad Pattern Scale

The Fairbanks Straight Line Lever Pattern Railroad Track Scale is furnished in several distinct types, and also with a wide variety of platform lengths and capacities.

Complete information will be cheerfully furnished upon request.

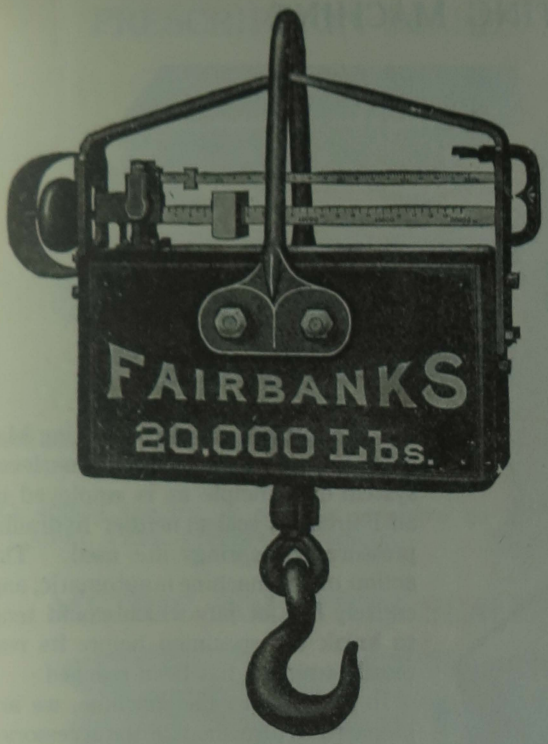


Fig. 3251

COMPOUND SUSPENSION SCALES

This form of scale is designed for weighing articles of all kinds in the act of being loaded, unloaded or otherwise moved by cranes. The goods are weighed as they are lifted, the time and labor of placing them on and removing them from a platform scale being saved.

It is especially adapted for use in iron and steel mills, foundries, shipyards, etc., for weighing castings and forgings, plates, boilers and machinery of all kinds, and is also useful on docks and railway platforms for weighing material during removal from ships, canal boats, railway trucks, warehouses, etc.

NOS.	Capacity, Lbs.	Height, Inches	Weight Each, Lbs.	Each
276	2,500x2	31	140	$150.00
280	5,000x5	34	210	250.00
286	10,000x5	36	260	350.00
290	20,000x5	44	430	500.00
292	30,000x5	45	580	550.00
294	40,000x5	44	700	650.00

The "height" given in the above description is the space occupied by the machine from the loop at the top to the hook beneath.

SOUTHERN COTTON-WEIGHING OUFTITS

This outfit especially designed for weighing bales of cotton. Furnished complete as shown or the beam and poises can be furnished without the frame.

NOS.	Capacity, Lbs.	Beam Description	Each
431	700x1	Japanned Iron, Notched Top	$91.00
433	700x1	Polished Steel Blade, Not'd Top	105.00
435	700x1	Japanned Iron, Smooth Top	90.00
437	700x1	Polished Steel Blade, Smooth Top	104.00
432	800x1	Japanned Iron, Notched Top	106.00
434	800x1	Polished Steel Blade, Not'd Top	121.00
435	800x1	Japanned Iron, Smooth Top	105.00
438	800x1	Polished Steel Blade, Smooth Top	120.00
		Beams with Poises Only	
200	700	Japanned Iron, Notched Top	$51.00
201	700	Polished Steel Blade, Not'd Top	66.00
202	700	Japanned Iron, Smooth Top	50.00
203	700	Polished Steel Blade, Smooth Top	65.00
204	800	Japanned Iron, Notched Top	61.00
205	800	Polished Steel Blade, Not'd Top	75.00
206	800	Japanned Iron, Smooth Top	60.00
207	800	Polished Steel Blade, Smooth Top	74.00

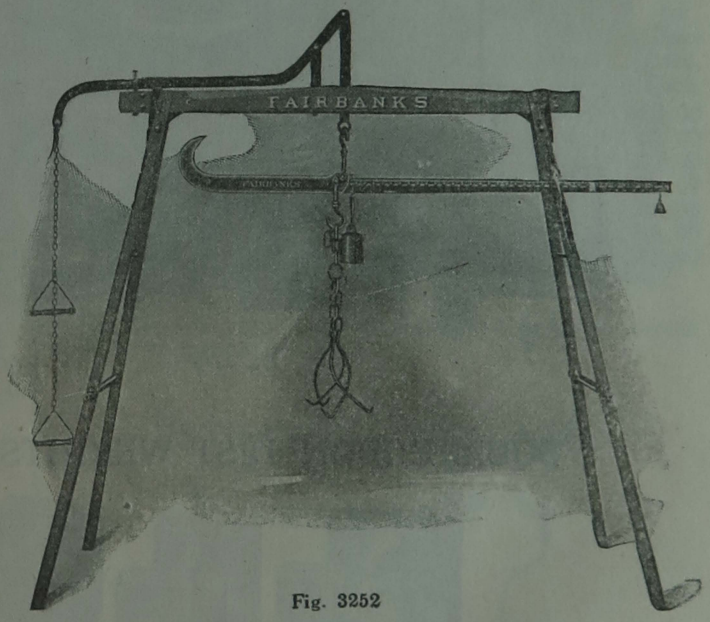


Fig. 3252

WEIGHMASTERS' BEAMS

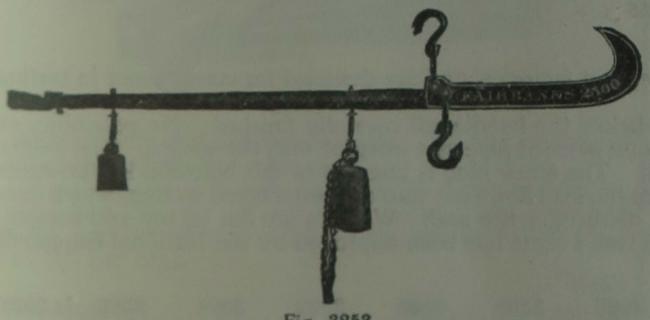


Fig. 3253

NOS.	Japanned Iron Blade Capacity, Lbs.	Each
116	600x½	$45.00
124	1200x1	60.00
128	2000x1	110.00
130	2500x1	130.00
	Polished Steel Blade	
NOS.	Capacity, Lbs.	Each
117	600x½	$50.00
125	1200x1	70.00
129	2000x1	125.00
131	2500x1	145.00

Prices with Poises only.

FAIRBANKS CEMENT TESTING MACHINE

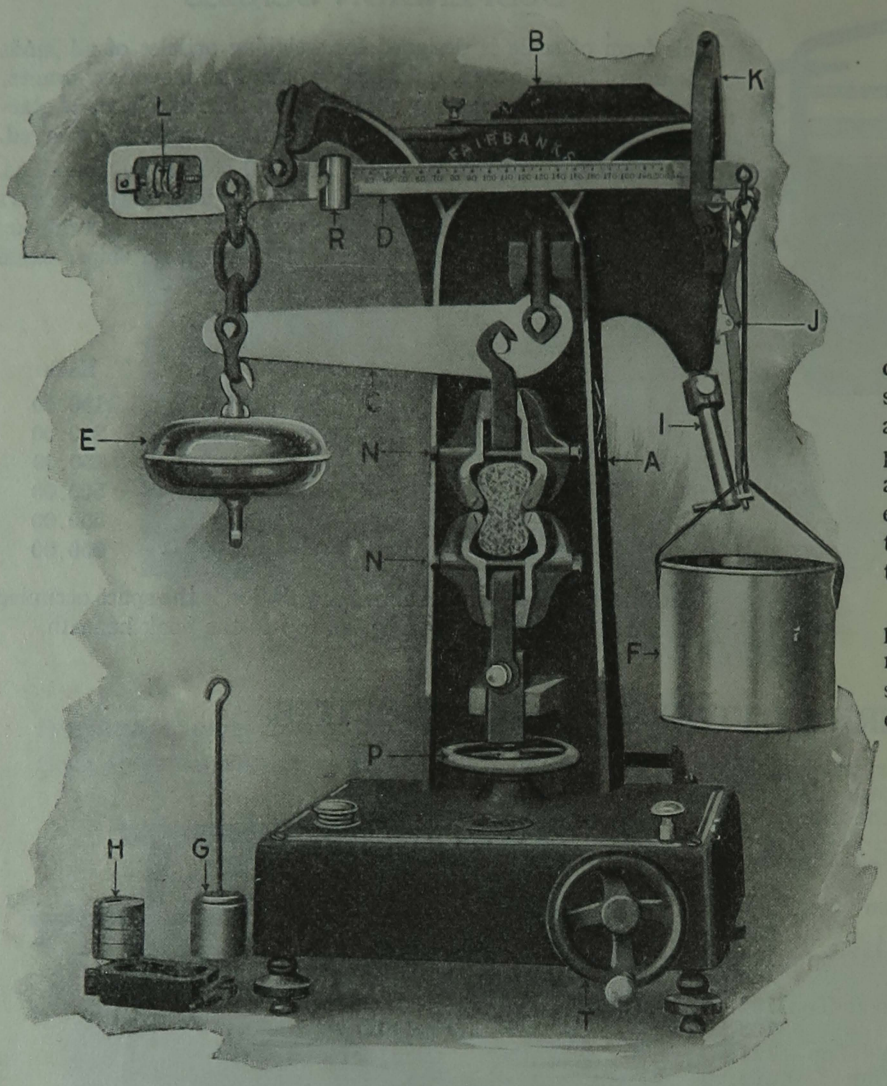


Fig. 3254

NO. 3184

1000 Lbs. Capacity

The Fairbanks Cement Testing Machine is constructed on the same lever system or principle as is employed in all Fairbanks scales; neither hydraulic pressure nor springs are used. The action of the machine is automatic, and entirely free of jars which would tend to break the specimen before its real tensile strength has been reached.

In addition to the machine, we are prepared to furnish all of the accessories necessary for making complete test, such as briquette molds, sieves, scales, etc.

Write for catalog on cement testing.

SQUARE IRON TEST WEIGHTS—PIPE HANDLE PATTERN

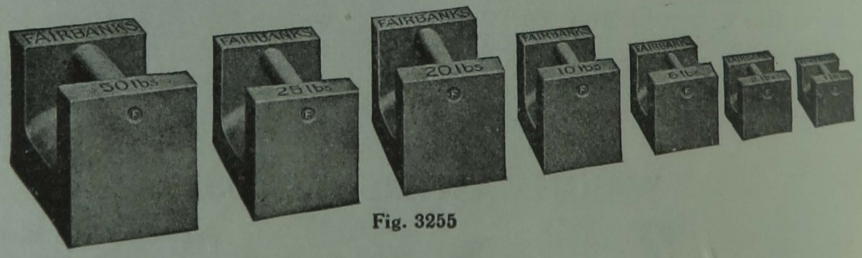


Fig. 3255

These weights are a necessary equipment for mills, mines and factories, and are designed for convenience in testing the heavier types of scales.

Made of fine smooth grain cast iron with gable shape below the handle, all carefully finished. No possibility of foreign material adhering to the surface. Handle is formed of a piece of pipe cast integral with the weight. The weight is drilled out on one end on the axis of the pipe and tapped. The screw plug is inserted in this hole and is afterwards covered by a lead seal. When the lead seal is driven in place the lead flows out into a counterbored section, which fixes the seal securely in position. Cannot be altered without disturbing the seal. Weights are flat on top and bottom. Regularly furnished in black japan. Method of sealing the test weight has been approved by the National Bureau of Standards.

NOS.	3586	3588	3590	3592	3594	3596	3598
Weight, Lbs.	50	25	20	10	5	2	1
Each	$7.50	5.00	4.50	3.50	3.00	2.50	1.75

PRESCRIPTION SCALES

Fig. 3256

All exposed parts are nickel-plated; furnished in ebonized or oak box with drawers and marble top.

	Each
NO. 409—Capacity, 4 ounces; sensitive to 1-30 grain; Pans, 3 inches in diameter	$18.00

METRIC SOLUTION SCALES

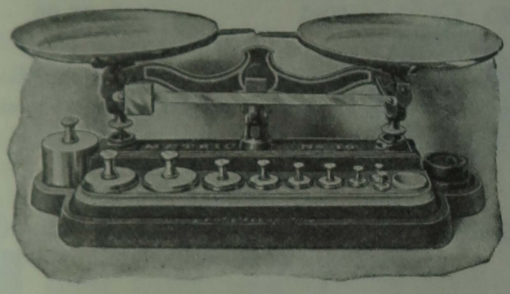


Fig. 3257

An even balance scale for making rapidly re-agent or any other kind of composite solutions.

Has two movable brass pans. Weight rack is attached to the base of scale; and in it are fitted the weights, which are made of solid brass. Provided with a side beam in front, undivided, used for balancing the bottles or containers.

NOS.	Diameter Pans, Inches	Capacity	Sensibility	Each
10L	9	5 kilos to 1 gram	500 mg.	$35.00
8L	5½	1 kilo to 1 gram	500 mg.	30.00

SOLDER TEST SCALES

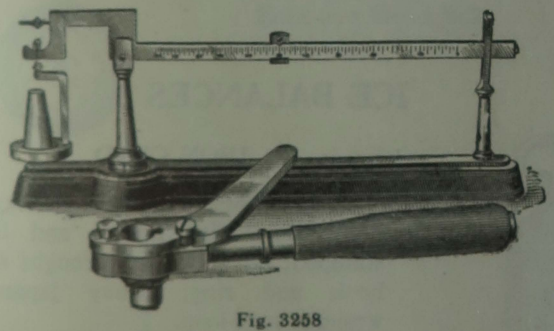


Fig. 3258

Substantially and accurately made, with agate bearings throughout. Complete with mold.

To make a test it is only necessary to take a cast in the mold, place the cast on the scale, poise it with the slide weight, and the pointer will show the amount of tin from 0 to 100 per cent.

	Each
With Mold	$40.00
With Mahogany Glass Case, front counterpoised sliding door and drawer extra	15.00

GOLD SCALES

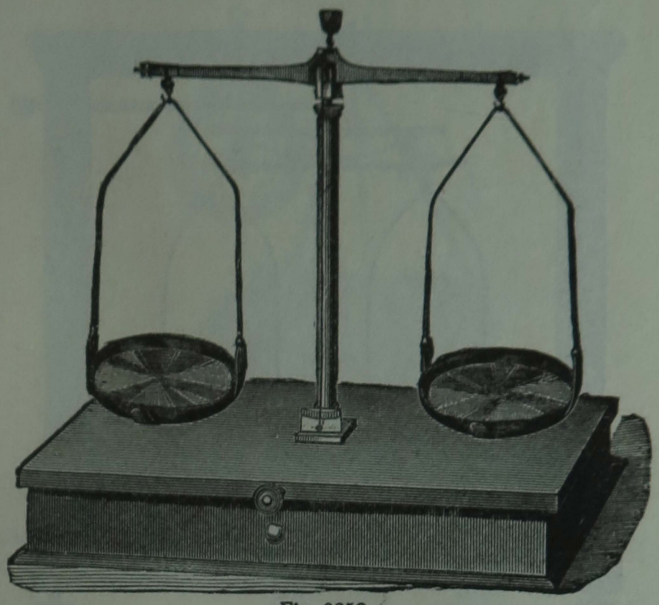


Fig. 3259

Constructed of brass, highly finished, of superb workmanship and lacquered to prevent tarnishing. Movable pans, with improved lever for lifting; adjusting screws on ends of beam. On polished walnut boxes, or in glass case with drawer.

NOS.	Diam. of Pans, Inches	Length of Beam, Inches	Cap. in Each Pan, Ounces	Length of Box, Inches	On Box, Each	In Glass Case, Each
1	3½	7	8	12	$11.50	$20.00
2	4	8	16	13½	13.50	22.00
3	4½	9	30	15	15.50	27.00
4	5½	10	50	17½	18.00	31.00
5	7	12	64	20	23.00	38.00
6	7½	15	75	24	28.00	44.00
7	10	18	100	on base	45.00	71.00

Prices do not include weights.

No. 7 is well adapted for silverware, owing to its 10-inch wide bows and great height.

ESTIMATING BALANCES

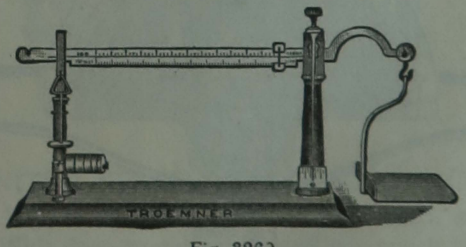


Fig. 3260

For estimating cost of quantity by weighing a single piece. With this estimator the correct weight of the quantity will be shown at a glance. No time lost in figuring or errors can occur.

To operate, place the article on the scale pan, slide the poise along beam until scale balances, which will indicate the result in pounds, ounces and fractions of ounces; how much material will be needed per 1000, 100, gross or dozen. Scale will weigh from the smallest sample up to one pound.

NOS.	Each
320—Estimator	$41.00
320C—Mahogany Case with Sliding Door for No. 320	20.50

ANALYTICAL BALANCES

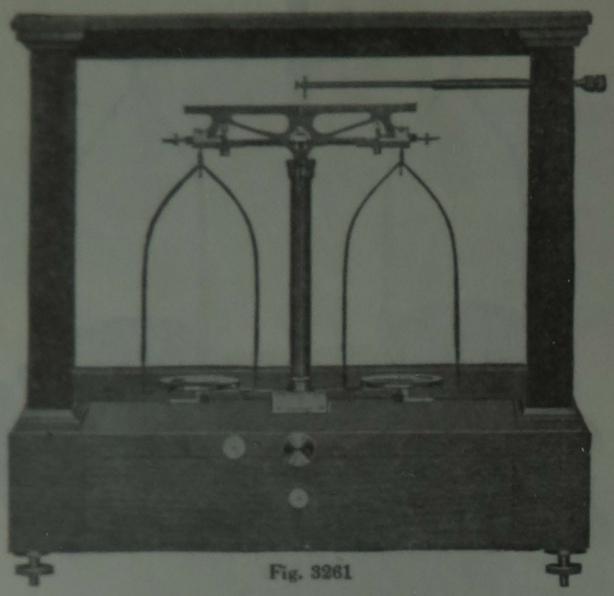


Fig. 3261

Agate knife-edges and agate bearings.

Beam and hanger supports fall away, so that when the balance is at rest the knife-edges are not in contact with the bearings. This protects the sensibility. Push-button pan arrest.

Beam is of aluminum alloy, divided on right-hand side into 50 divisions; improved rider carriage.

Have beam and hanger arrests, new type, holding the beam and hanger secure and rigid when being loaded or unloaded.

Pans are of solid nickel.

French polished mahogany case; counterpoised sliding front glass sash. Have glass sashes back and both ends and on top. Cabinet has drawer and screw leveling feet.

Each

NO. 61—Capacity Each Pan, 200 Grams; Sensibility, $\frac{1}{10}$ Milligram; Beam, 7 Inches (17.7cm.); Pans, 2½ Inches Diameter; Bows, 3¼ Inches Wide, 6 Inches High; Case, 17x9x16 Inches....$93.00

DYNAMOMETERS

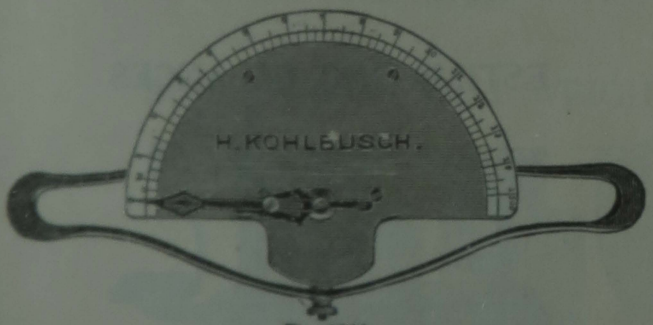


Fig. 3262

Used for ascertaining the draft of plows, mowing machines, wagons and cars. Can be attached to a tackle on a derrick for hoisting hay, feed or cargo of any description, the weight of which can at once be read on dial.

It will also show what weight a horse can pull, by securing one end and hitching an animal to the other; also the testing of electric, steam or horse cars, and any other traction purpose.

NOS.	Range, Lbs.	Each
67	From 0 to 2,000 x 25 Lbs.	$36.00
67a	From 0 to 3,500 x 50 Lbs.	42.00
68	From 0 to 5,000 x 50 Lbs.	48.00
69	From 0 to 10,000 x 100 Lbs.	80.00

All kinds of special dynamometers made to order.

SPRING BALANCES

Fig. 3263

HEAVY STRAIGHT SPRING BALANCES WITH HOOK

Japanned stamped steel case; polished brass face; figures and lines stamped; tinned wrought steel hook and ring.

NOS.	Capacity, Lbs.	Per Dozen
16	25x½	$6.00
19	50x1	12.00
20	80x1	36.00

NO. 16 Scales Packed Half Dozen in Paper Box
NO. 19 Scales Packed Quarter Dozen in Paper Box

STRAIGHT SPRING BALANCES EXTRA HEAVY

Japanned stamped steel case; polished brass face; figures and lines stamped; tinned wrought steel hook and ring.

NOS.	Capacity, Lbs.	Each
21	100x1	$5.25
23	150x1	7.50
24	200x2	9.00

Each in a Paper Box

Fig. 3264

ICE BALANCES

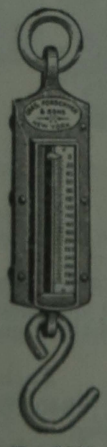


Fig. 3265

IRON CLAD

Japanned heavy malleable iron case; brass face, with figures and lines stamped; heavy tinned wrought steel hook and ring; heavy japanned wrought steel loop.

Length of case, 6 inches; length over all, 13 inches.

NOS.	Capacity Lbs.	Each
572	200-2	$7.50
56	300-5	8.25
56½	400-5	9.00
56¾	500-5	10.50

CIRCULAR SPRING BALANCES

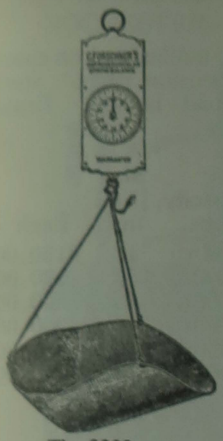


Fig. 3266

With tin scoop and chains; japanned cast iron case; polished brass face and dial; figures and lines stamped.

NOS.	Capacity	Size Scoop, Inches	Each
81	30 Lbs.x1 Oz.	14x14x8	$10.00
82	60 Lbs.x2 Oz.	17x17x11	12.00
081	30 Lbs.x1 Oz.	20x20x12	13.50
082	60 Lbs.x2 Oz.	20x20x12	15.50

UNITED STATES MARKET BALANCES

Black enameled steel case; nickel plated brass rim, with glass face, 10 inches in diameter; diameter of dial, 8 inches; figures and lines enameled black; nickel plated brass bow and hook; nickel plated brass ring at top; round porcelain enameled pan 15 inches in diameter, with nickel silver rim; height overall, 32 inches.

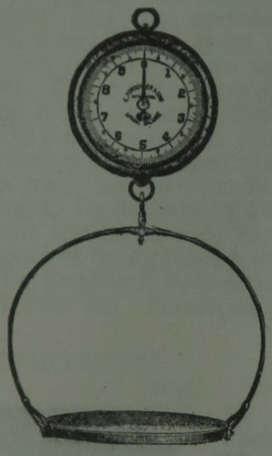


Fig. 3267

NOS.	Capacity	Size Pan, Inches	Each
1000	15 Lbs.x½ Oz.	13	$15.00
1001	30 Lbs.x1 Oz.	13	15.00
1002	60 Lbs.x1 Oz.	13	16.50
1041	30 Lbs.x1 Oz.	15	18.50
1042	60 Lbs.x1 Oz.	15	20.00

For double dials add to price, $7.50.
Each in a Wood Box

Fig. 3268

Similar construction to above type but with removable, deep blue and white enameled fish pans.

NOS.	Capacity	Size Pan, Inches	Each
1029	15 Lbs.x½ Oz.	15	$15.00
1030	30 Lbs.x1 Oz	15	15.00
1031	60 Lbs.x1 Oz.	15	16.50

Each in a Wood Box

CIRCULAR SPRING BALANCES

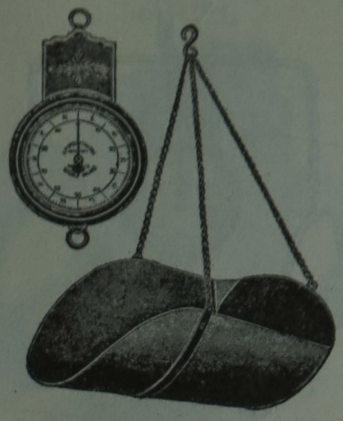


Fig. 3269

UNITED STATES MARKET BALANCES

With galvanized scoops and chains. Black enameled, case adjusted by set screw in pointers, with large white dial and glass sash.

NOS.	Capacity	Size Dials, Ins.	Size Sash, Ins.	Size Scoop, Inches	Each
232	30 Lbs.x1 Oz.	8	10	14x14x8½	$15.00
233	60 Lbs.x1 Oz.	8	10	20x20x12	17.00
234	120 Lbs.x4 Oz.	8	10	24x24x15	34.00
235	150 Lbs.x4 Oz.	8	10	24x24x15	40.00
1735	200 Lbs.x4 Oz.	10	12	30x30x20	50.00
236	300 Lbs.x4 Oz.	10	12	30x30x20	55.00
1783	400 Lbs.x8 Oz.	10	12	30x30x20	65.00
237	600 Lbs.x8 Oz.	10	12	36x36x22	80.00

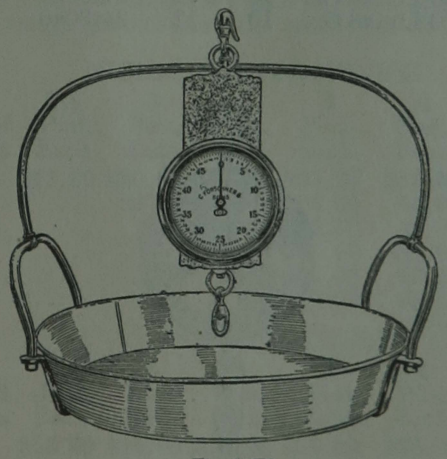


Fig. 3270

UNITED STATES MARKET BALANCES

With large white dial, glass sash and black enameled case. With deep round galvanized pan which is removable and wrought iron bows.

NOS.	Capacity	Size Dial, Inches	Size Sash, Inches	Size Pan, Inches	Each
215	30 Lbs.x1 Oz.	8	10	18x4	$18.00
216	60 Lbs.x1 Oz.	8	10	20x4	20.00
217	120 Lbs.x4 Oz.	8	10	24x5	34.00
218	150 Lbs.x4 Oz.	8	10	26x5	40.00
1725	200 Lbs.x4 Oz.	10	12	33x6	50.00
219	300 Lbs.x4 Oz.	10	12	33x6	55.00
1728	400 Lbs.x8 Oz.	10	12	33x6	65.00
220	600 Lbs.x8 Oz.	10	12	36x6	80.00

CIRCULAR SPRING BALANCES

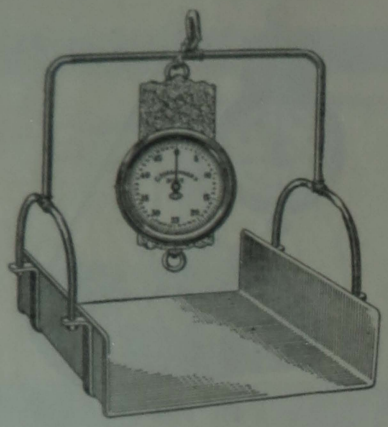


Fig. 3271

UNITED STATES MARKET BALANCES

With removable square galvanized iron pan and iron bows. Pan reinforced with steel strips on sides and bottom. Large white dial and nickel plated brass frame with glass sash.

NOS.	Capacity	Size Dial, Ins.	Size Sash, Ins.	Size Pan, Ins.	Each
208	30 Lbs.x1 Oz.	8	10	16x18x4	$18.00
209	60 Lbs.x1 Oz.	8	10	16x18x4	20.00
210	120 Lbs.x4 Oz.	8	10	20x24x5	24.00
211	150 Lbs.x4 Oz.	8	10	22x28x6	40.00
1715	200 Lbs.x4 Oz.	10	12	22x28x6	50.00
212	300 Lbs.x4 Oz.	10	12	24x30x6	55.00
1718	400 Lbs.x8 Oz.	10	12	24x30x6	65.00
213	600 Lbs.x8 Oz.	10	12	24x30x6	80.00

Fig. 3272

WAREHOUSE BALANCES

Substantially constructed for rough usage. Heavy iron cases with brass fronts. Wrought steel double hooks and ring.

NOS.	Capacity, Lbs.	Size Dial, Ins.	Each	NOS.	Capacity, Lbs.	Size Dial, Ins.	Each
967	100x¼	8	$16.00	985	400x1	10	$24.00
975	200x1	8	18.00	986	400x1	12	32.00
980	300x1	8	20.00	990	600x1	12	38.00
984	400x1	8	22.00	987	400x1	15	36.00
976	200x½	10	20.00	991	600x1	15	60.00
981	300x1	10	22.00	...	.....	..	.....

CIRCULAR COAL BALANCES

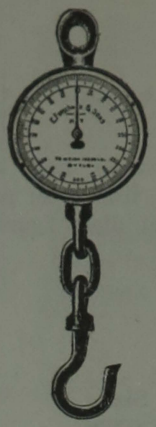


Fig. 3273

Heavy malleable iron cases and suspension rings. Steel swivel load hooks. Brass fronts.

NOS.	Capacity, Lbs.	Size Dial, Ins.	Each
993	1000x5	12	$130.00
994	1200x5	12	170.00
995	1500x5	15	200.00
996	2000x5	15	300.00
998	3000x5	15	400.00
999	5000x10	15	600.00

NEW MARKET SCALES

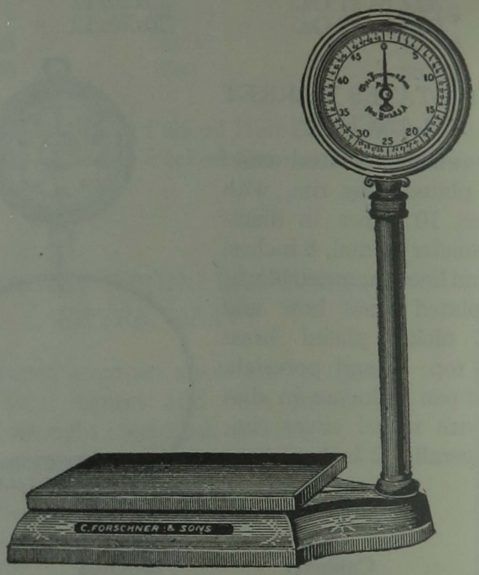


Fig. 3274

Platform type of scale with 8 inch double dials mounted on a 16 inch cast iron column. 10 inch sash. Size of platform 11½x14½ inches.

NOS.	Capacity	Each
418	50 Lbs.x2 Oz.	$44.00
419	100 Lbs.x4 Oz.	48.00

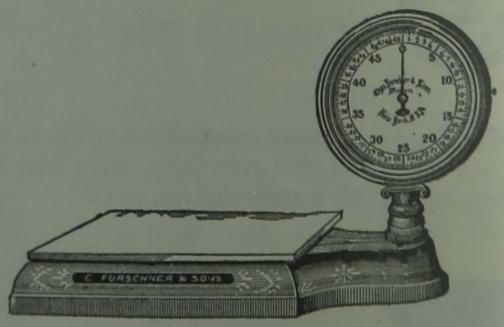


Fig. 3275

This scale is the same as that illustrated above but is without the long column. Has 8 inch dials, 10 inch sash, and iron platform, 11½x14½ inches.

NOS.	Capacity	Each
406	50 Lbs.x2 Oz.	$40.00
407½	100 Lbs.x4 Oz.	44.00

FORCE FEED LUBRICATORS

ROCHESTER—RATCHET OR CLUTCH TYPE

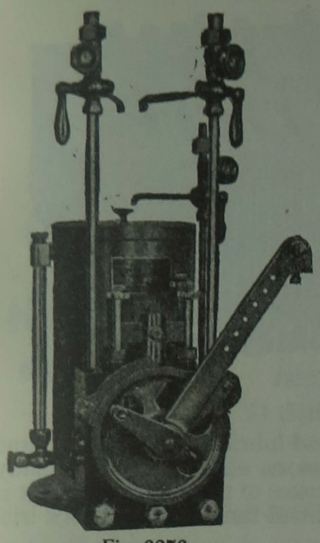


Fig. 3276

Triple Feed Ratchet Drive

For lubricating the cylinders of all types of engines, pumps, air compressors, etc.; not affected by temperature, pressure or vacuum. Each feed can be regulated independently, to feed from the smallest fraction of a drop per minute to an almost continuous stream. All the mechanism is compactly centered on a steel pump block, the principal working parts being enclosed and protected from dirt, grit, etc. This block, with all the mechanism, can be removed quickly for cleaning, repairing, etc., without disturbing the reservoir attached to the engine. The arm or lever can be operated from any desired point in the circle and maintain the working of the main driving pawl on top of the ratchet wheel. Pump piston is operated by an improved slide holding it to cross arm. Slide is operated by encased cam. Oil is discharged at each revolution of ratchet wheel; lubricators are equipped with crank handles for hand operation when necessary; multiple sight feeds show the oil passing to its destination and the quantity delivered. Two pint and larger sizes have vacuum and check valves which prevent back pressure and vacuum affecting oil line. **Can be furnished with clutch or ratchet** driving mechanism at same list. Furnished in nickel plated finish.

SINGLE COMPARTMENT

No. Feeds	Capacity, Pints	Wgt. Each, Lbs.	Each	No. Feeds	Capacity, Pints	Wgt. Each, Lbs.	Each
1	½	11½	$20.00	3	4	51	$70.00
1	1	12	25.00	3	8	53	80.00
1	2	27	30.00	3	16	74	90.00
1	3	31	35.00	4	4	54	90.00
1	4	38	40.00	4	8	56	100.00
1	8	40	45.00	4	16	75	105.00
2	2	30	45.00	5	16	81	120.00
2	3	32	50.00	6	16	87	130.00
2	4	40	55.00	7	16	95	140.00
2	8	42	60.00	8	16	100	150.00
2	16	62	75.00	..	..	...	.....

One-half pint and one pint sizes are adapted for light work where number of revolutions do not exceed 100 per minute.

WITH TWO COMPARTMENTS

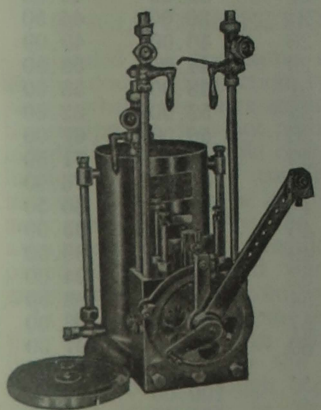


Fig. 3277

Feeds two kinds of oil from one lubricator. Adapted for air compressors, ice machines, etc., where two kinds of oil are used in the different cylinders of same machine. Equipped the same as lubricators listed above.

No. feeds	Capacity, pints	Wt. Each, Lbs.	Each
2	3	34	$55.00
2	8	44	65.00
3	8	57	85.00
4	8	59	105.00

If one or more feeds are to be used for Ammonia cylinders, mention that fact in your order.

FORCE FEED LUBRICATORS

MANZEL

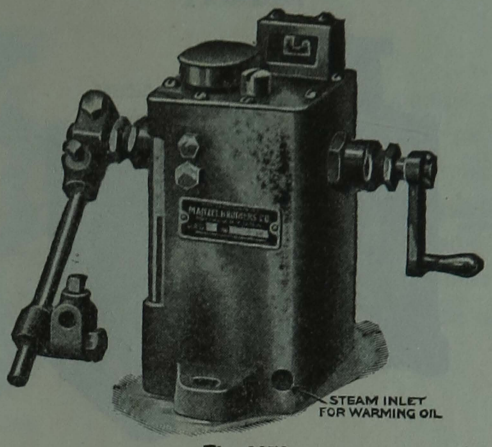


Fig. 3278

PISTON VALVE TYPE

Entirely automatic in action, always adjusting themselves to the speed of the engine, and supplying just the amount of oil the engine needs. Will handle either heavy or light oil in warm or cold weather, operate equally well on either high or low speed engines, and will pump against any pressure required on a steam engine.

Operated on the piston valve principle, large size piston or cut-off valves being located directly underneath the plungers. This arrangement leaves the oil channels entirely clear, and there is no possibility of dirt or foreign matter interfering with the operation of the oiler. Pistons are actuated by an eccentric cam attached to a hexagon driving shaft; mechanism is entirely enclosed and works in the oil continually.

Every oiler is provided with a hand attachment for use before starting the engine, or if a larger supply of oil is needed for a few moments while the engine is running, and with a gauge glass to show the amount of oil in the reservoir.

NICKEL-PLATED FINISH

No. of Feeds	1½ Pint, Each	3 Pint, Each	4 Pint, Each	6 Pint, Each	8 Pint, Each	10 Pint, Each
1	$17.00	$20.00	$24.00	$30.00	$36.00	$42.00
2	.....	26.00	30.00	36.00	42.00	48.00
3	.....	.....	36.00	42.00	48.00	54.00
4	.....	.....	42.00	48.00	54.00	60.00
5	.....	.....	.....	54.00	60.00	66.00
6	.....	.....	.....	60.00	66.00	72.00

PAINTED FINISH

No. of Feeds	1½ Pint, Each	3 Pint, Each	4 Pint, Each	6 Pint, Each	8 Pint, Each	10 Pint, Each
1	$13.00	$15.00	$18.00	$23.00	$28.00	$33.00
2	.....	20.00	23.00	28.00	33.00	38.00
3	.....	.....	28.00	33.00	38.00	43.00
4	.....	.....	33.00	38.00	43.00	48.00
5	.....	.....	.....	43.00	48.00	53.00
6	.....	.....	.....	48.00	53.00	58.00

All sizes furnished either right or left hand.

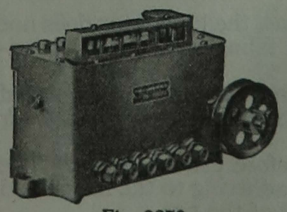


Fig. 3279

MOTOR TYPE

For gasoline motors, gas tractors, oil engines, etc.

For positively and economically lubricating the cylinders and bearings of internal combustion engines. Supply clean, fresh oil in just the right quantities and at exactly the right time.

Made with any number of feeds, and with either rotary-ratchet or direct drive.

Prices on Application

FORCE FEED LUBRICATORS

DETROIT

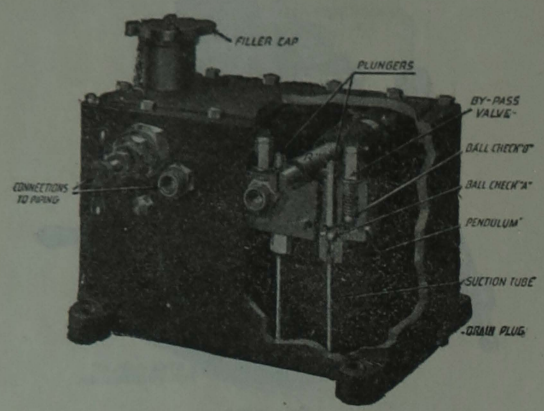


Fig. 3280

FLANGE OILERS—PENDULUM TYPE

Offered as the most efficient and practical device on the market for securing proper flange lubrication. Is a product that will meet perfectly every requirement of the class of service for which it is designed.

The advantages and economies resulting from flange lubrication are widely recognized and thoroughly understood—flange oilers increase tire mileage and decrease tire maintenance on locomotive tender and car wheels. They save the frequent turning of flanges and prevent the expenses represented by lost metal, labor costs and losses in revenue accruing during the extra shoppings necessitated by flange turning.

The pendulum type consists of an oil tank or reservoir mounted in any convenient position and a feed nozzle on the flange. Between these is a regulating valve which controls the flow of oil from the reservoir to the flange.

Any swinging motion or rolling on curves or lateral motion of any kind operates the pump in the following manner:

Pendulum is sensitive to the slightest movement, consequently any lateral motion of the locomotive causes it to swing; as the pendulum is pinned to oiler shaft, this swinging motion results in alternating strokes of the two plungers in the pumping unit.

On the up stroke of a plunger oil is drawn up past the Ball Check; on the down stroke, Ball Check closes the passage into the suction tube and oil is forced past the other ball check and into the pipe leading to the feed nozzle.

The regulating valves are installed in the pipe line, just above the feed nozzles, and are within easy reach. Each valve controls the amount of oil that is fed to the flange and is regulated to meet the particular requirements of each individual installation.

Oiler can be installed to lubricate one, two, three or four wheels, as required by the individual requirements of the locomotive.

The feed is governed entirely by the requirements of the service. Never requires any manipulation by the engineer as in the case of a manually operated device, where it is practically impossible to insure the operator's starting and stopping it at every curve.

Once set to suit local conditions, the lubricator does not need the daily adjustment and filling required by lubricators in the cab.

It does not take up any room in an already overcrowded cab, and does not place any tax upon an overloaded air pump.

Requires no steam, and therefore cannot freeze. The absence of steam insures the oil adhering to the flange and prevents spattering on the tread of the tire.

Any kind of oil that will flow freely can be used, as proper operation does not depend upon the use of some particular brand, owing to the fact that no steam is used.

Prices on Application

FORCE FEED LUBRICATORS

DETROIT

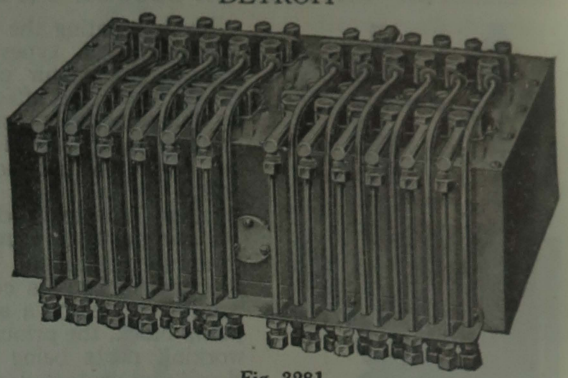


Fig. 3281

MODEL G

Designed for the mechanical lubrication of gas, oil and gasoline engines, air compressors, etc. They are equally well adapted for use on all classes of machinery where it is desired to feed oil from a central tank to the various frictional surfaces.

The advantages of this system of lubrication are: cool, clean oil forced by mechanical pressure and in quantities as needed to the proper point to be lubricated; the oiler controlled by the speed of the machine to which it is attached so that automatically the oil stops or starts feeding and increases or decreases in amount to correspond to the needs of the machine; the oil forced to each part can always be determined easily as it has first to pass through a sight feed mounted on the cover of the pump; the operator has only one tank to fill, and the lubricating system requires very little attention. Each feed is operated by a separate pumping unit which can be regulated as desired. The driving mechanism is attached to the cover and runs in the oil, preventing rust and excessive wear and making the operation noiseless.

Leaks at the delivery connections are impossible since the oil is fed through the cover.

Handles cold and heavy oil and is not affected by changes in temperature.

No. of Feeds	Length, Inches	Capacity, Pints	Approx. Weight Complete, Each Lbs.	Iron Tank Brass Trimmings, Each	With Polished Cast Aluminum or Built-up Brass Reservoir, Brass Trimmings Each
1	5	3	7	$10.00	$13.50
2	6	3½	9	12.00	17.00
3	7	4	11	15.00	20.50
4	8	4½	13	18.00	24.00
5	9	5	15	21.00	27.50
6	10	5½	17	24.00	31.00
7	11	6	19	28.00	35.50
8	12	6½	21	32.00	40.00
9	14	7½	24	36.00	44.50
10	15	8	26	40.00	49.00
11	16	8½	29	44.00	53.50
12	17	9	31	48.00	58.00
13	18	9½	34	52.00	62.50
14	19	10	36	56.00	67.00
15	20	10½	39	60.00	71.50
16	21	11	41	64.00	76.00
17	23	12	44	68.00	80.50
18	24	12½	46	72.00	85.00
19	25	13	49	76.00	89.50
20	26	13½	52	80.00	94.00
21	27	14	54	84.00	98.50
22	28	14½	57	88.00	103.00
23	29	15	60	92.00	107.50
24	30	15½	..	96.00	112.00
25	31	16	..	100.00	116.50
26	32	16½	..	104.00	121.00
27	33	17	..	108.00	125.50
28	34	17½	..	112.00	130.00

SIGHT FEED LUBRICATORS

DETROIT IMPROVED STANDARD DOUBLE CONNECTION

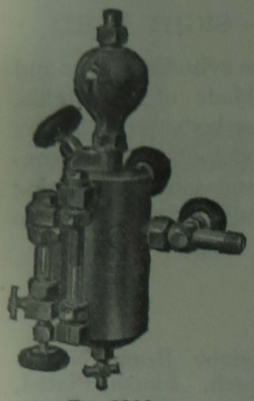


Fig. 3282

Used on all kinds of reciprocating steam engines, steam pumps, etc. Steam is admitted into the condensing chamber and after condensation the water passes through a pipe to the bottom of the oil chamber forcing the oil through the outlet opening at the top of the chamber and so through the sight feed glass to the point to be lubricated. Steam in the cored heating passage keeps the oil at an even temperature so that heavy oils can be fed.

Furnished in ⅓, ½, 1, 2, 4 and 8 pint sizes. Polished brass or nickel plated finish.

Prices on Application

SINGLE CONNECTION

Used where a double connection lubricator cannot be installed due to lack of room.

This type is substantially the same as the double improved standard except for the changes in the condensing tube and support arm necessitated by using a single connection. Both have the same internal construction.

The ¼-pint size has no gauge glass.

Furnished in ¼, ⅓, ½, 1 and 2 pint sizes. Polished brass or nickel plated finish.

Prices on Application

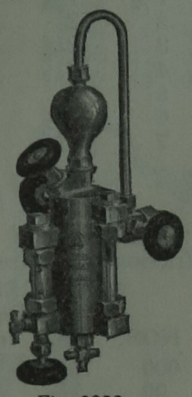


Fig. 3283

DETROIT ZERO DOUBLE CONNECTION

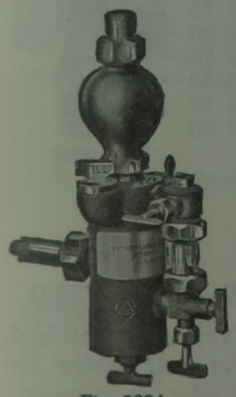


Fig. 3284

Operates on same principle as Improved Standard type. For use in outdoor service, particularly in exposed places subject to low temperatures. Made in two styles. Style A is for installation with both connections between boiler and throttle. Style C is designed to take steam above throttle and deliver oil below throttle either into steam pipe or directly into steam chest. Style A always furnished unless Style C is ordered.

Furnished with rough body and polished trimmings in brass or nickel, ¼, ⅓, ½, 1 and 2 pint sizes.

Prices on Application

SINGLE CONNECTION

Intended for the same service as the double connection type in places where the arrangement of the equipment does not permit the installation of a double connection lubricator. Their construction includes an automatic oil heating arrangement whereby the oil is always kept hot, and a regular feed of oil is thus assured when the engine is exposed to cold weather.

In the ½, ⅓ and ¼ pint sizes the filler and upper gauge arms are combined, eliminating the gauge.

Furnished with rough body and polished trimmings in brass or nickel in ¼, ⅓, ½, 1 and 2 pint sizes.

Prices on Application

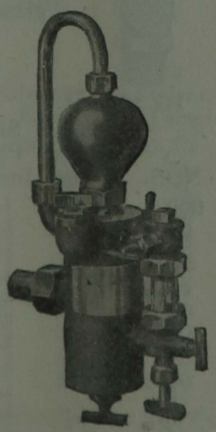


Fig. 3285

ENGINE LUBRICATORS

PLAIN

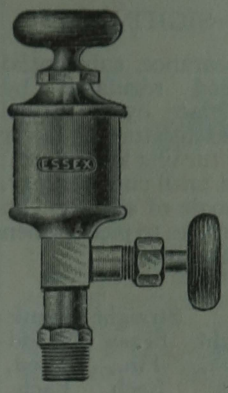


Fig. 3286

Used on steam pumps and engines. Made of heavy cast brass, in two parts. Either shank or cup can be renewed separately, if damaged; valve in shank acts as a feed regulator and also allows filling of cup while engine or pump is running.

NOS.	Diam. Cup, Inches	Capacity, Ounces	Pipe Size, Inches	Weight Each, Pounds	Each
00	1	¾	⅜	.75	$2.00
0	1¼	1	⅜	.85	2.20
1	1½	1¼	⅜	.90	2.40
2	1¾	1½	½	1.01	2.60
3	2	2½	½	1.02	2.90
4	2¼	4	½	1.60	3.25
5	2½	5	½	1.75	3.75
6	3	10	¾	2.36	4.75
7	3½	18	¾	3.75	7.00
8	4	24	¾	4.75	10.00

SIGHT FEED

Not for Steam

For use on gas engines, air compressors, etc. Nickel or brass finish.

To operate; valves C and B are closed, the cup A filled with oil and filled plug D tightened. Valve C is then opened and flow of oil then regulated by valve B.

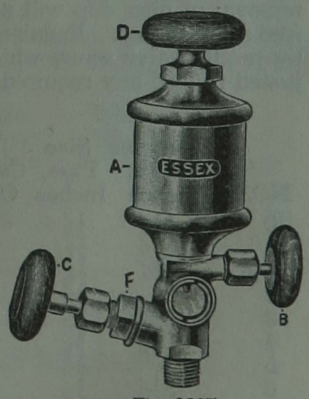


Fig. 3287

NOS.	Diam. Cup, Inches	Size Pipe, Inches	Capacity, Pints	Weight Each, Lbs.	Each
0	1½	⅜	1/16	1.50	$3.50
1	1¾	⅜	1/16	1.60	4.00
2	2	⅜	⅛	1.75	4.50
3	2¼	⅜	¼	2.	5.00
4	2½	½	⅓	2.12	6.00
5	3	½	½	2.75	8.00
6	3½	½	1	3.50	12.00
7	4¼	¾	2	5.00	16.00

EXTRA SIGHT FEED GLASSES AND WASHERS

For Lubricators Nos. 0 to 7, per dozen.....$0.60

Fig. 3288

GLASS BODY OIL CUPS

ESSEX

SNAP LEVER—SIGHT FEED

Ornamental in appearance, substantial in construction. Feed regulated by thumb nut held in place by a curved spring; feed is opened by turning lever upright and closed by turning lever down; rate of feed is constant until cup is empty. By turning lever to angle of 45° cup can be flushed. Will not shake to pieces when placed on vibrating machinery.

NOS.	Diam. Glass, Inches	Size Pipe Thread, Inches	Capacity, Ounces	Weight Each, Lbs.	Straight Brass Fin., Each	Shank Nickel Plated, Each
0	1¼	⅛	⅝	.25	$3.00	$3.50
1	1½	¼	1	.28	3.25	3.75
1½	1¾	¼	1½	.60	3.50	4.00
2	2	⅜	2½	.75	3.75	4.25
3	2¼	⅜	4	.85	4.25	4.75
4	2½	⅜	5	1.20	5.25	5.75
5	3	½	10	1.80	7.25	8.00
6	3½	½	18	3.75	9.25	10.25
7	4¼	¾	36	4.00	20.00	22.00

AUTOMATIC CRANK PIN AND CROSS HEAD OILERS

Automatic in action and feeds only when in motion, the centrifugal force carrying the oil to the top of cup and through holes located in casing of regulating screw chamber. Made of cast brass, neat in appearance.

Tightening of cup proper to prevent leaking through cork washers and the removal of filler cup will not disturb the feed after it is set. Regulation is obtained by needle valve screw which can be adjusted to feed any required amount.

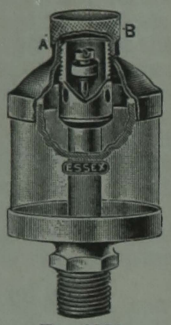


Fig. 3289

NOS.	Diameter Glass, Inches	Size Pipe, Inches	Capacity, Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
0	1¼	⅛	⅝	.25	$1.10	$1.25
1	1½	¼	1	.36	1.50	1.70
1½	1¾	¼	1½	.50	2.00	2.25
2	2	⅜	2½	.65	2.50	2.75
3	2¼	⅜	4	.75	3.00	3.30
4	2½	⅜	5	1.	4.00	4.35
5	3	½	10	1.55	6.00	6.50
6	3½	½	18	1.75	9.00	9.50

FOR USE ON PRESSURE SYSTEMS

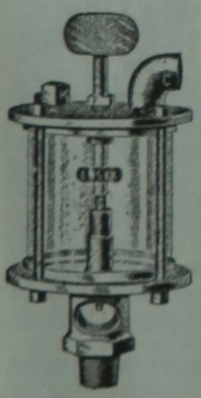


Fig. 3290

Heavy and strong. Has four guards to hold the top and lower caps together. Will stand 75 to 100 pounds pressure. Glass in shank is pressure tight.

NOS.	Dia. Glass, Ins.	Size Pipe Thread, Ins.	Cap. Ozs.	Brass Fin. Each	Nick. Fin. Each
4	2½	⅜	5	$7.25	$8.00
5	3	½	10	8.80	9.80
6	3½	½	18	10.50	11.60
7	4¼	¾	36	14.75	16.60

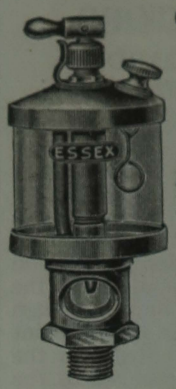


Fig. 3291

GLASS BODY OIL CUPS

ESSEX

GLASS BODY—SIGHT FEED

For lubricating the cylinders of gas and gasoline engines. Made of cast brass, highly finished; glass body protected by cork washers; compact and sturdy construction to withstand vibration; spring controlled feed regulator; snap-lever to stop and start feed.

NOS.	Diam. Glass, Inches	Size Pipe, Inches	Capacity, Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
1½	1¾	¼	1½	.60	$4.00	$4.50
2	2	⅜	2½	.86	5.00	5.50
3	2¼	⅜	4	1.	5.50	6.00
4	2½	⅜	5	1.40	6.50	7.00
5	3	½	10	1.75	9.00	9.75
6	3½	½	18	1.85	11.50	12.25
7	4¼	¾	36	3.60	15.00	16.00

FRICTION SCREW

Made of cast brass, highly polished; glass reservoir; friction screw feed regulator; slide filler hole cap.

NOS.	Diam. Glass, Ins.	Size Pipe, Ins.	Wgt. Each, Lbs.	Brass Fin., Each	Nick. Plat., Each
000	1	⅛	.20	$0.70	$0.80
00	1⅛	⅛	.31	.75	.85
0	1¼	⅛	.35	.80	.95
1	1½	¼	.47	1.00	1.20
1½	1¾	¼	.59	1.25	1.50
2	2	⅜	.83	1.50	1.75
3	2¼	⅜	.95	1.90	2.20
4	2½	⅜	1.30	2.40	2.75
5	3	½	1.90	3.10	3.50
6	3½	½	2.40	4.00	4.50
7	4¼	¾	2.95	6.20	7.20

Fig. 3292

Same capacity as sight feed cups listed above.

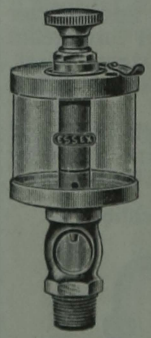


Fig. 3293

FRICTION SCREW—SIGHT FEED

Friction screw feed oil cup with sight feed shank, intended to be used where an inexpensive sight feed oiler is required. Highly polished cast brass frame with glass reservoir.

NOS.	Diam. Glass, Inches	Size Pipe, Inches	Capacity, Ounces	Weight Each, Lbs.	Fin. Brass, Each	Nickel Plated, Each
000	1	⅛	¼	.23	$0.95	$1.10
00	1⅛	⅛	½	.33	1.10	1.20
0	1¼	⅛	⅝	.50	1.25	1.40
1	1½	¼	1	.75	1.50	1.70
1½	1¾	¼	1½	.85	1.75	2.00
2	2	⅜	2½	1.20	2.10	2.35
3	2¼	⅜	4	1.75	2.55	2.85
4	2½	⅜	5	1.90	3.15	3.50
5	3	½	10	2.00	3.90	4.30
6	3½	½	18	2.60	4.80	5.30
7	4¼	½	36	3.75	10.00	12.00

HAND OIL PUMPS

COMBINATION GLASS BODY

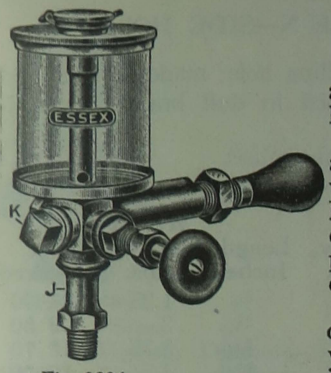


Fig. 3294

Made to permit of being attached either vertically or horizontally.

The filling hole is closed by a hinged cap, and is provided with a wire gauze strainer. Plunger is well made and very durable. All parts about the pump are heavy and well constructed.

Presents a handsome and ornamental appearance, being well designed and nicely finished. Made of brass.

NOS.	Diam. Glass, Inches	Size Pipe, Inches	Capacity, Pints	Weight Each, Lbs.	Brass Fin., Each	Nickel Plated, Each
3	2¼	⅜	¼	2.82	$6.25	$7.00
5	3	⅜	½	3.47	8.50	9.50
6	3½	½	1	4.37	10.00	11.00
8	4¼	½	2	5.25	13.50	15.00

LEVER PATTERN GLASS BODY

Intended to be used in connection with sight-feed lubricators on stationary or marine engines. No large engine should be without a pump of this kind as an auxiliary to sight-feed lubricator.

Made of brass and furnished polished or nickel plated finish.

Can be used vertically only.

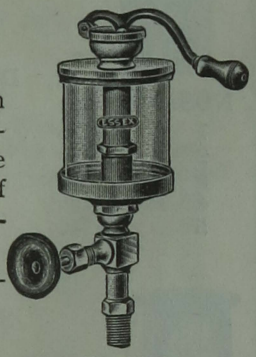


Fig. 3295

NOS.	Diam. Glass, Inches	Size Pipe, Inches	Capacity, Pints	Weight Each, Lbs.	Brass Fin., Each	Nickel Plated, Each
3	2½	⅜	¼	2.38	$6.25	$7.00
5	3	⅜	½	3.	8.50	9.50
6	3½	½	1	5.13	10.00	11.00
8	4¼	½	2	5.94	13.50	15.00

OIL CUP AND PUMP GLASSES

Fig. 3296

Interchangeable with glasses used in oil cups, oil pumps and glass body lubricators of standard manufacture. Clear, strong and uniform.

Cork washers necessary with these glasses are separately listed.

NOS.	Diameter Glass, Inches	Height Glass, Inches	Weight Each, Lbs.	Glasses, Each	Cork Washers, per Dozen
000	1	⅞	.03	$0.05	$0.15
00	1⅛	1	.03	.06	.18
0	1¼	1⅛	.05	.08	.24
1	1½	1⅜	.08	.10	.30
1½	1¾	1⅝	.10	.10	.36
2	2	1⅞	.14	.12	.40
3	2¼	2⅛	.24	.15	.45
4	2½	2⅜	.26	.25	.50
5	3	3	.42	.35	.60
6	3½	4	.85	.65	.75
7	4¼	5	1.21	1.50	1.50

Note.—To avoid mistakes when ordering glasses and cork washers, specify number of cup as stamped on same.

HAND OIL PUMPS

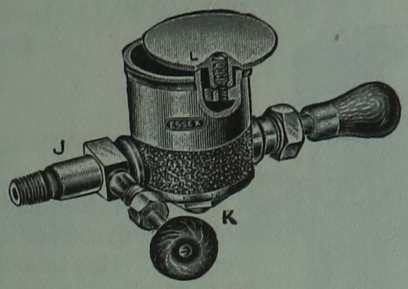


Fig. 3297

Improved, all brass. Made for either horizontal or vertical connections. Made with swing cover, held in place by a heavy spring. This method dispenses with burnt fingers and losing covers. Can also be furnished with screw cover if desired. Made with ⅜-inch shank.

NOS.	Capacity, Pints	Diam. Bowl, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Finish, Each
0	¼	2¼	2.12	$3.50	$4.00
1	½	2¾	2.50	5.00	5.65
2	1	3½	3.00	7.50	8.40

PULLEY OIL CUPS

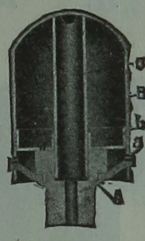


Fig. 3298

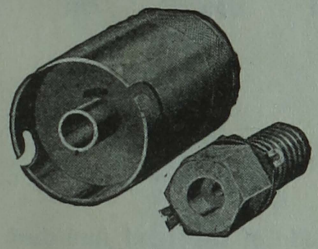


Fig. 3299

Drawn from rolled sheet metal of such weight that counterbalancing is unnecessary.

There are no moving parts to wear or bind. They never wear out. Suitable for various kinds of machinery. Feeds only when pulley is in motion.

NOS.	Capacity, Ounces	Size Pipe, Inches	Weight Each, Lbs.	Each
1	..	⅛	⅛	$0.50
2	½	¼	⅛	.60

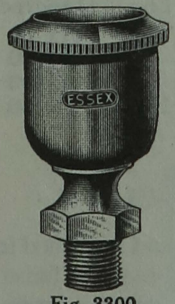


Fig. 3300

OIL CUPS

PLAIN BRASS BODY

Heavy cast brass, full polished finish. Screw top, with clean cut threads.

NOS.	O. D. Cup, Ins.	Size Pipe, Ins.	Cap., Ozs.	Wgt. Each, Lbs.	Plain, Each	Add For Nick. Plated, Each	Add For Brass Wick Tubes, Each
00	21/32	⅛	.10	.07	$0.25	$0.10	$0.10
0	25/32	⅛	.20	.10	.30	.10	.10
1	⅞	⅛	.30	.13	.35	.10	.10
2	1 1/16	¼	.50	.19	.40	.10	.10
3	1¼	¼	.80	.28	.60	.10	.15
4	1 15/32	⅜	1.25	.44	.90	.15	.15
5	1⅝	⅜	1.75	.50	1.25	.15	.15
6	1 13/16	⅜	2.50	.61	1.60	.15	.15
7	2	½	3.50	.80	1.75	.20	.15
8	2 3/16	½	4.50	1.05	2.25	.20	.20
9	2 7/16	½	6.50	1.23	2.75	.20	.20

OIL CUPS

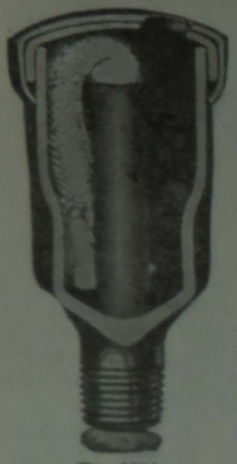


Fig. 3301

STYLE E—WICK OILING

Made of steel, plain or nickel-plated with steel or brass revolving cap. Has tube and wicking which gives slow, steady feed, regardless of amount of oil in body.

NOS.	Size Pipe Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
70	1/8	3/4	1 3/4	8.	$14.00
7	1/8	3/4	2	9.	17.00
8	1/8	15/16	2 1/8	12.	26.00

STYLE F—WITH OR WITHOUT WICK

Made of steel and furnished in plain or nickel plated finish. Has self-closing cover. Spring is made of the best grade of steel, finely tempered to give long service.

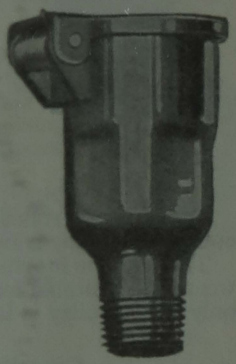


Fig. 3302

NOS.	Size Pipe Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
5	1/8	9/16	1 1/8	3.4	$11.00
6	1/8	11/16	1 1/2	5.	13.00
7	1/8	3/4	1 11/16	8.	15.00
8	1/8	15/16	1 15/16	10.5	19.00

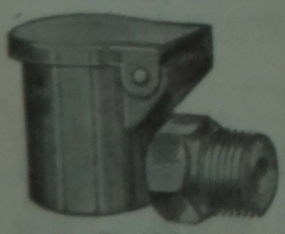


Fig. 3303

STYLE J—ELBOW

Made of steel and furnished in plain or nickel-plated finish. Has self-closing cover. Spring made of best grade of steel nicely tempered. Feeds at right angle and is convenient for use where an ordinary cup will not fit.

NOS.	Size Pipe Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
5	1/8	5/8	13/16	4.7	$14.00
6	1/8	3/4	15/16	6.	17.00
7	1/8	7/8	1 1/8	7.	19.00
8	1/8	1 1/32	1 3/8	9.5	21.00

OIL CUPS

Fig. 3304

STYLE N—SIDE HOLE

With side filling hole; made of steel and can be furnished in dull brass or nickel-plated finish.

NOS.	Size Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4x32v	13/32	5/8	1.25	$7.00
2	5/16x32v	1/2	23/32	2.	9.50
3	3/8x24v	1/2	27/32	3.75	10.70
4	7/16x24v	9/16	15/16	4.5	12.50
5	1/2x24v	5/8	1 1/16	5.	16.00

STYLE A—SNAP COVER

Snap cover; made of brass and furnished in dull brass or nickel-plated finish.

Fig. 3305

NOS.	Size Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4x32v	1/4	3/8	.5	$7.00
2	5/16x32v	5/16	15/32	.75	9.50
3	3/8x24v	3/8	9/16	1.	10.70
4	7/16x24v	7/16	9/16	1.75	12.50
5	1/2x24v	1/2	5/8	2.	16.00

Fig. 3306

STYLE D—SNAP COVER

Similar to style A but of larger capacity. Made of brass and furnished in dull brass or nickel-plated finish.

NOS.	Size Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4x32v	5/16	5/8	1.	$7.00
2	5/16x32v	3/8	3/4	1.2	9.50
3	3/8x24v	7/16	3/4	1.75	10.70
4	7/16x24v	1/2	7/8	2.5	12.50
5	1/8 pipe	5/8	1 3/16	4.	16.00
40	1/8 female	1/2	1 1/4	4.5	20.00

STYLE D—LARGE

Made of steel and furnished plain or nickel-plated.

Fig. 3307

NOS.	Size Pipe Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
50D	1/8	9/16	1 1/8	3.	$7.00
60D	1/8	11/16	1 7/16	4.5	9.00
70D	1/8	3/4	1 15/16	7.5	11.00
80D	1/8	15/16	2	10.	13.00

DUST PROOF OIL CUPS

Fig. 3308

STYLE L

Self-closing dust proof; made of brass in plain or nickel plated finish.

NOS.	Size Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4x32v	5/16	5/8	.75	$7.00
2	5/16x32v	3/8	3/4	1.25	9.50
3	3/8x24v	7/16	7/8	2.	10.70
4	7/16x24v	1/2	1	3.	12.50
5	1/8 pipe	5/8	1 1/8	5.75	16.00

STYLE C

Self-closing; made of steel and furnished in nickel plated finish.

Fig. 3309

NOS.	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4	3/8	.2	$4.00
2	5/16	3/8	.25	5.00
3	3/8	1/2	.5	6.25
4	7/16	1/2	.6	7.50
5	1/2	1/2	.75	8.75
6	9/16	5/8	1.	10.00
7	5/8	5/8	1.2	12.00

Fig. 3310

STYLE G

Self-closing; made of steel and furnished in plain or nickel plated finish.

NOS.	Diameter, Inches	Length, Inches	Fits Hole, Inches	Weight Per 100, Lbs.	Per Hundred
1	1/4	3/8	1/4	.5	$4.00
2	5/16	3/8	5/16	.75	5.00
3	3/8	7/16	3/8	1.	6.25
4	7/16	1/2	7/16	1.5	7.50

OIL HOLE COVERS

STYLE K

Made of brass, plain or nickel plated. Self-closing, dust proof, top can be pushed in with spout of oil can.

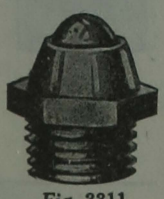


Fig. 3311

NOS.	Size Thread, Inches	Diameter, Inches	Length, Inches	Weight Per 100, Lbs.	Per Hundred
20	1/4x32v	5/16	3/8	.5	$4.00
21	5/16x32v	3/8	7/16	.75	4.70
22	3/8x24v	7/16	17/32	1.25	5.30
23	1/8 Pipe	1/2	19/32	1.75	6.00
24	1/4 Pipe	5/8	11/16	3.25	7.50
25	3/8 Pipe	3/4	3/4	6.	10.50

OIL FEED VALVES

SNAP LEVER—SIGHT FEED

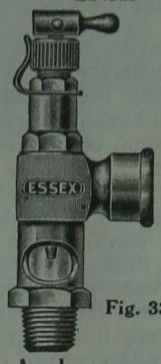


Fig. 3312

Angle

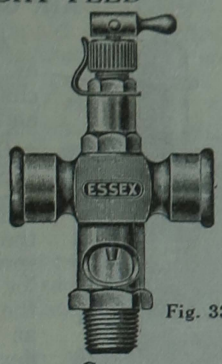


Fig. 3313

Cross

For oiling systems of engines and machinery. Cast brass; polished finish.

WITH PIPE THREAD END

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
79	1/8	.50	$2.30	$2.60
80	1/4	.55	2.30	2.60
81	3/8	.65	2.75	3.05
82	1/2	.69	3.20	3.50

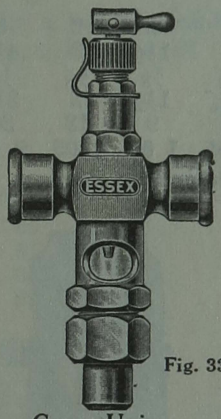


Fig. 3314

Cross Union

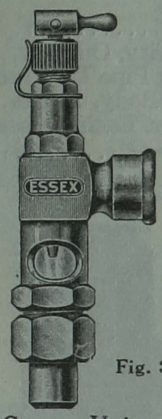


Fig. 3315

Corner Union

FOR USE WITH COPPER TUBING

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
83	1/8	.50	$2.80	$3.10
84	1/4	.55	2.80	3.10
85	3/8	.65	3.25	3.55
86	1/2	.69	3.70	4.00

OIL GAUGES

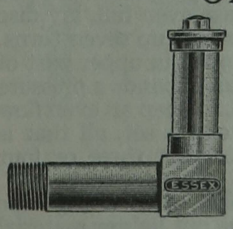


Fig. 3316

Plain

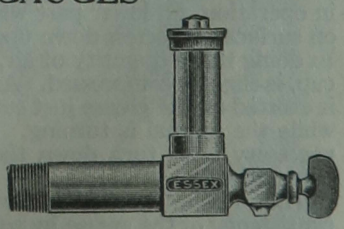


Fig. 3317

With Drain Cock

FOR SELF-OILING RESERVOIR OR OIL WELL BEARINGS

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
0	1/8	.20	$0.80	$1.00
1	1/4	.25	.90	1.10
2	3/8	.34	1.05	1.25
3	1/2	.50	1.40	1.65

GREASE CUPS

AIR COMPRESSION

Fig. 3318

Adapted for use on overhead lines of shafting, countershafts, friction clutch pulleys, link belt machinery and journals of all kinds.

Feed can be shut off even when compression is on.

Compression is provided automatically by screwing down the top of the grease cup itself. The light spring is adapted to provide capacity for leveling the grease when adjusting the top to the grease filled body and, at the same time, insures greater flexibility and positiveness of operation by supplementing the air pressure, especially at periods just prior to readjustment.

The rate of feed is conveniently controlled by turning the top of the cup by hand and the compressed air, thus regulated, insures sufficient pressure for positive, automatic feeding without detriment to the consistency of the grease.

Cup feeds in any position and against centrifugal force. Made of cast iron, painted.

NOS.	00	0	1	2	3
Capacity, Ounces	⅓	1	1½	3	4½
Shank Pipe Thr., Inches	¼	¼	⅜	⅜	½
I. D. Body, Inches	1	1¼	1½	2	2½
Weight Each, Ounces	5	7	9	13	20
Each	$0.85	.95	1 00	1.05	2.10

No. 2 can be furnished with ½-inch male shank.

Fig. 3319

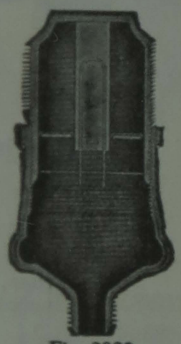


Fig. 3320

Substantially made of steel, in two parts; lower part threaded half way down on inside, upper part threaded full length outside and made to fit into lower part. A flat disc swings loosely from center of upper half. To put in operation, fill lower part with grease even full, lay disc on surface and screw down upper part of cup seven turns. In doing this a quantity of air, entrapped in upper part of cup, is slightly compressed. As this air expands a pressure is exerted on the grease just sufficient to keep an even flow while the journal is turning. After cup is set, all that is necessary is to turn down the upper part three or four turns a week.

The pressure exerted is never sufficient to change the consistency of the grease by squeezing out lighter material first.

Feeds on high or low speed at any angle.

NOS.	1	2	3	4
Capacity, Ounces	½	1	3	6
Diameter Base, Ins.	1¼	1¾	2¼	2¾
Height Filled, Ins.	2¾	3½	4¾	5½
Height Emptied, Ins.	1¾	2⅛	2⅞	3¼
Shank Pipe Size, Ins.	⅛ or ¼	¼ or ⅜	⅜ or ½	½ or ¾
Weight Each, Lbs.	5/16	3/16	⅞	1 1/16
Plain Steel, Each	$1.00	1.25	1.50	1.75
Polished Steel, Each	$1.20	1.60	2.00	2.50

GREASE CUPS

ESSEX

Fig. 3321

AUTOMATIC COMPRESSION

For bearings, shafting, etc. Outlet through shank is provided with plug to regulate quantity.

Economical in operation and one filling can be so regulated as to last a long time.

NOS.	Dia., In	Shank Pipe Thread, Inches	Capacity, Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
00	1	⅛	⅓	.20	$1.50	$1.75
0	1¼	¼	1	.50	2.00	2.25
1	1½	¼	1½	.65	2.50	2.80
2	2	⅜	3	1.	3.20	3.60
3	2½	½	6	1.75	4.30	5.00
4	3	½	10	2.5	6.00	6.75

IMPROVED AUTOMATIC COMPRESSION

Highly finished; leather packed plunger controlled by turn handle, which has automatic lock to prevent jarring from position. Flow of grease regulated by screw in shank. Pressure on grease entirely removed by screwing down controlling thumb nut.

Fig. 3322

NOS.	Dia., Inches	Shank Pipe Thread, Inches	Capacity, Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
00	1	⅛	⅓	.19	$1.50	$1.75
0	1¼	¼	1	.50	2.00	2.25
1	1½	¼	1½	.65	2.50	2.80
2	2	⅜	3	1.	3.20	3.60
3	2½	½	6	1.75	4.30	5.00
4	3	½	10	2.5	6.00	6.75

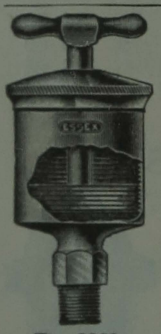


Fig. 3323

POSITIVE FEED

Made expressly for feeding heavy grease and dope to bearings and preferred in many cases to the spring compression cup, where the temperature is continually changing, this style of cup being strongly indorsed for marine purposes.

Cast brass, plain screw feed. Heavy and substantial.

NOS.	Dia., Inches	Shank Pipe Thread, Inches	Capacity, Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
00	1	⅛	⅓	.25	$1.00	$1.20
0	1¼	¼	1	.50	1.20	1.45
1	1½	¼	1½	.65	1.60	1.90
2	2	⅜	3	1.2	2.00	2.40
3	2½	½	6	1.75	2.80	3.40
4	3	½	10	2.65	4.00	4.75

GREASE CUPS

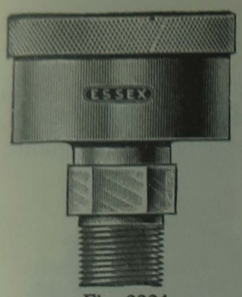


Fig. 3324

HANDY

Plain compression; cup is cast brass; heavy and substantial.

NOS.	Dia., Inches	Shank Pipe Thread, Inches	Cap'cy Ounces	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
00	1	1/8	1/4	.14	$0.70	$0.80
0	1 1/4	1/4	2/3	.25	.90	1.00
1	1 1/2	1/4	1	.32	1.15	1.30
2	2	3/8	2	.60	1.50	1.70
3	2 1/2	1/2	3 1/2	1.	2.15	2.45
4	3	1/2	5	1.5	2.90	3.20

BASSICK

Can be furnished in brass or steel, either plain or plated, and with or without leather washer and locking device. The double prong locking device prevents the cap from jarring loose and makes it easier to start the cap on the threads after filling.

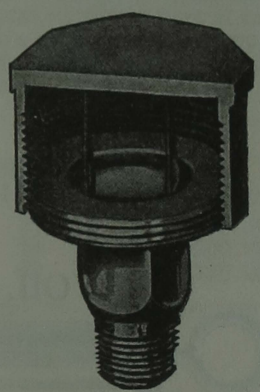


Fig. 3325
With Locking Device

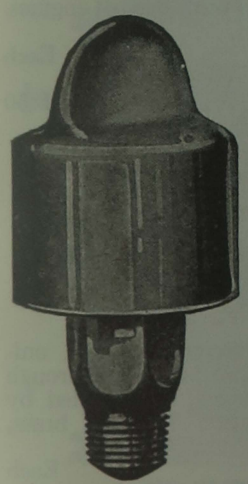


Fig. 3326
With Wing Cap

It loosens the grease in the cup when the cap is turned, preventing clogging in the base.

These caps are furnished in four types as follows: male thread, with locking device and leather washer or plain, male thread, without locking device but with leather washer; plain with female thread or with female thread and locking device; with one piece wing nut cap with or without locking device and leather washer.

NOS.	O.D. Cups, Ins.	Size Pipe Thread, Ins.	Capac-ity, Ozs.	Wgt. Per 100, Lbs.	Each
000	2 9/32	1/8	1/4	5.4	....
00	1 1/8	1/8	1/2	8.3	....
0	1 7/16	1/4	2/3	14.	....
1	1 21/32	1/4	1	20.1	....
2	2 3/16	3/8	2	31.9	....
3	2 11/16	1/2	3 1/2	55.	....
4	3 3/16	1/2	5	82.	....

Prices on Application

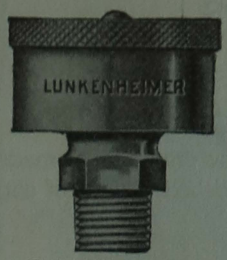


Fig. 3327

GREASE CUPS

TIGER—CAST BRASS

Well adapted for jarring or vibrating machinery. Has leather washer which prevents grease from leaking out of cup. The spring locking arrangement prevents the cap from jarring off and also cuts and loosens the grease when cap is screwed down.

NOS.	Diam-eter, Inches	Shank Pipe Thread, Inches	Capac-ity, Ozs.	Wgt. Each, Lbs.	Rough Brass, Each	Fin. Brass, Each	Nickel Plated Each
000	7/8	1/8	1/8	.09	...	$0.50	$0.60
00	1 1/8	1/8	1/2	.13	$0.56	.70	.82
0	1 15/32	1/4	2/3	.24	.74	.90	1.06
1	1 21/32	1/4	1	.31	.96	1.15	1.36
2	2 5/32	3/8	2	.58	1.28	1.50	1.80
3	2 21/32	1/2	3 1/2	1.00	1.76	2.15	2.60
4	3 5/32	1/2	5	5.00	3.20	3.30	3.40

WIPER CUPS

CRANK PIN—ADJUSTABLE

For adjustable crankpins; made of heavy brass, highly polished. Adjustable for height.

Fig. 3328

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
60	1/8	.15	$2.50	$3.00
61	1/4	.25	2.50	3.00
62	3/8	.27	2.75	3.25
63	1/2	.30	3.00	3.50

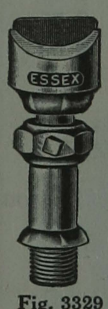


Fig. 3329

BEARING—ADJUSTABLE

With large wiper head, for engine and machinery bearings; highly polished cast brass; adjustable for height.

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
64	1/8	.15	$2.50	$3.00
65	1/4	.25	2.50	3.00
66	3/8	.27	2.75	3.25
67	1/2	.30	3.00	3.50

PLAIN

For use with brass pipe and fittings, on bearings of engines.

Fig. 3330

NOS.	Diameter, Inches	Pipe, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
72	1 1/4	1/4	.13	$1.00	$1.25
73	1 1/2	3/8	.20	1.50	1.75
74	2	1/2	.22	2.00	2.40

WIPER CUPS

Fig. 3331

ADJUSTABLE
CRANK PIN—ELBOW SHANK

Elbow shank for crank pins; made of brass nicely polished; height of cup can be adjusted.

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
68	1/8	.50	$3.00	$3.50
69	1/4	.55	3.00	3.50
70	3/8	.60	3.25	3.75
71	1/2	.75	3.50	4.00

ADJUSTABLE
ELBOW SHANK—BEARING

For use on engine bearings; highly polished cast brass; height of cup is adjustable.

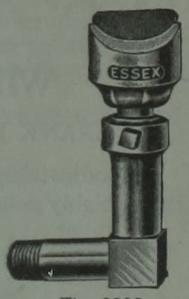


Fig. 3332

NOS.	Size, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
75	1/8	.50	$3.00	$3.50
76	1/4	.55	3.00	3.50
77	3/8	.60	3.25	3.75
78	1/2	.75	3.50	4.00

Fig. 3333

HORIZONTAL WICK

Made of brass throughout; cotton wick riveted to side.

NOS.	Size Pipe, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
79	1/8	.13	$2.00	$2.30
80	1/4	.15	2.00	2.30
81	3/8	.16	2.15	2.45
82	1/2	.18	2.30	2.60

DRIP TROUGHS

Made of brass nicely polished.

Fig. 3334

NOS.	Size Pipe, Inches	Length, Inches	Weight Each, Lbs.	Brass Finish, Each	Nickel Plated, Each
84	1/4	3	.15	$1.00	$1.25
85	3/8	5	.18	1.50	2.00
86	1/2	7	.20	2.00	2.75

PRIMING CUPS

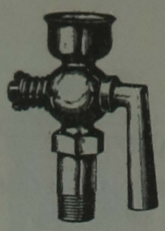


Fig. 3335

LEVER HANDLE

Plugs are well ground; do not leak, bind or jump; with spring and cotter pin, and pin check; made of brass throughout.

NOS.	Size Thread, Inches	Diameter Cup, Inches	Weight Each, Lbs.	Each
1	1/8	3/4	....	$0.90
2	1/8	7/8	....	1.00
3	1/4	3/4	....	1.05
4	1/4	7/8	....	1.15

ANGLE PATTERN
LEVER HANDLE

Made of brass throughout, with spring and cotter pin; furnished either right or left hand.

Fig. 3336

NOS.	Size Thread, Inches	Diameter Cup, Inches	Weight Each, Lbs.	Each
10	1/8	3/4	....	$1.00
11	1/8	7/8	....	1.05
12	1/4	3/4	....	1.10
13	1/4	7/8	....	1.15

OIL SYRINGES

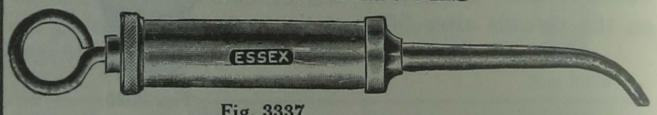


Fig. 3337

For oiling bearings or removing oil from base of engines, etc. Made of brass, highly polished.

Each

NO. 205—Barrel, 1¼x7 Inches; Weight Each, ¾ Lbs..... $1.50

GREASE PUMPS

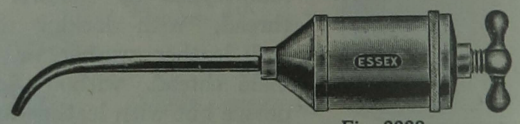


Fig. 3338

For filling transmission cases, differential gears, universal joints, etc., with grease; grease is forced through the spout by a screw-operated plunger; easily filled by unscrewing cap and removing plunger. Made of brass, highly polished.

Each

NO. 105—Barrel, 1¾x3½ Inches; Weight Each, 1 Lb..... $1.50

GREASE AND OIL GUNS

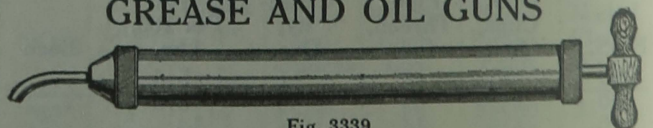


Fig. 3339

All brass; self-filling; for forcing grease or oil into planetary transmissions, rear axle bevel gears, etc.

Each

NO. 425—Size Barrel, 1½x12 Inches; Weight Each, 1½ Lbs..... $3.50

OIL FILTERS

TEN WINKEL

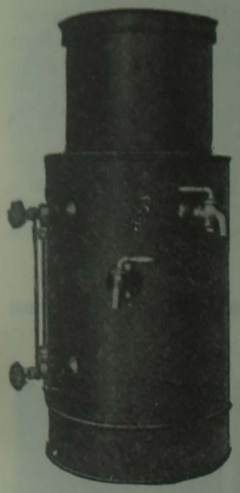


Fig. 3340

An automatic oil filter; has no filter cloths or other materials requiring either regulation or renewal; can be cleaned while in operation by opening a valve.

Made of the best material with careful workmanship; heavily reinforced and finished in hard baked enamel. It is practically indestructible. Oil containing water, carbon, dirt chips or other foreign matter is poured into the upper part of the filter, from where it passes through the double screens and around the hood. It is forced upward through a body of water and a conical screen to an overflow pipe, which conducts it to the bottom of the separating chamber. Here by gravity the oil filters through water and slime, and remains where it can be drawn off as needed, as pure and clean as when originally purchased.

NOS.	Filtering Capacity Per Day, Gallons	Diameter Base, Inches	Height, Inches	Weight Each, Lbs.	Each
0	50	14	34	40	$75.00
1	100	18	48	80	100.00
2	200	25	69	100	125.00

For other sizes or installations for special purposes, prices will be quoted on application.

CROSS

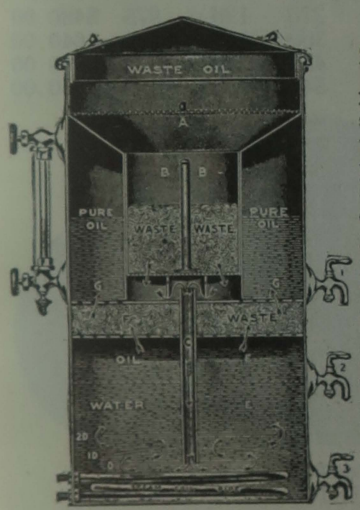


Fig. 3341

For filtering engine and common machinery oils. Waste is employed as the filtering medium, and a steam coil is placed near the bottom for the purpose of increasing the speed of the filter if it is desired to do so when the filter is located in a cool place. The waste oil is poured into the upper chamber, from which it passes through a chamber filled with waste and so on down through a tube into the water chamber, and there it is thoroughly cleaned as it rises by gravity and passes through another layer of waste into the pure oil chamber.

NOS.	Filtering Capacity per Day, Gallons	Capacity, Gallons Dirty Oil	Capacity, Gallons Pure Oil	Dimensions Inches, Dia.	Dimensions Inches, Hgt.	Weight Each, Lbs.	Each
1	20– 30	7	11	18	30	45	$37.00
2	5– 10	3	3	12	26	24	25.00
3	40– 50	17	20	24	36	82	75.00
4	60– 70	26	37	30	54	163	90.00
5	70– 90	32	49	33	56	184	110.00
6	100–120	45	60	35	60	208	130.00
7	120–150	52	75	35	75	233	160.00
8	150–200	57	90	40	90	340	190.00

OIL FILTERS

CROSS

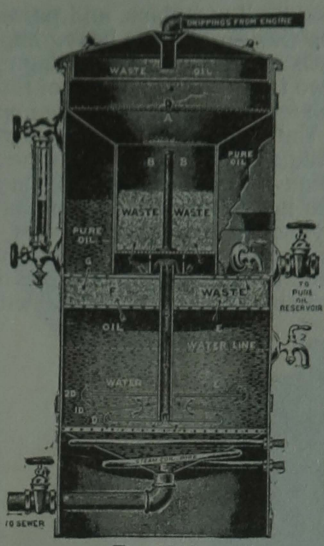


Fig. 3342

STYLE A

For reclaiming waste oil from collected drip pans, etc. Operates with practically no expense and purifies the waste oil no matter in what condition it may be when put in the filter.

Style A is furnished with a gate valve from the pure oil chamber, through which the filtered oil may be pumped to a reservoir until it is needed for use. If it is desired, steam may be circulated through the coil provided in the bottom of the filter to warm the interior and cause the oil to filter more freely and quickly. The dirty oil is entered at the top of the filter and passes through a chamber filled with waste and down a tube to the bottom of the water chamber. From there the oil rises by gravity and is thoroughly cleaned as it passes over and around the plates.

NOS.	Filtering Capacity Per Day, Gallons	Capacity, Gallons Dirty Oil	Capacity, Gallons Pure Oil	Dimensions Inches, Dia.	Dimensions Inches, Hgt.	Weight Each, Lbs.	Each
1	20– 30	7	11	18	36	54	$45.00
3	40– 50	17	20	24	42	98	80.00
4	60– 70	26	37	30	54	163	100.00
5	70– 90	32	49	33	56	184	120.00
6	100–120	45	60	35	60	208	135.00
7	120–150	52	75	35	74	233	165.00
8	150–200	57	90	40	76	340	200.00

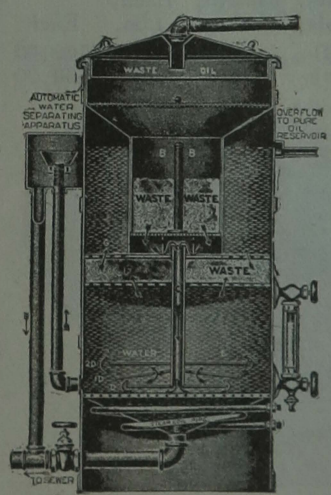


Fig. 3343

STYLE B

Similar to style A, but furnished with an automatic water separating device which will take the condensed water and oil from oil separators and exhaust heads, and successfully separate the oil from the water and filter the oil perfectly.

NOS.	Filtering Capacity Per Day, Gallons	Capacity, Gallons Dirty Oil	Capacity, Gallons Pure Oil	Dimensions Inches, Dia.	Dimensions Inches, Hgt.	Weight Each, Lbs.	Each
1	20– 30	7	11	25	36	69	$50.00
2	5– 10	3	3	18	30	45	35.00
3	40– 50	17	20	31	42	123	90.00
4	60– 70	26	37	37	54	188	110.00
5	70– 90	32	49	40	56	212	130.00
6	100–120	45	60	42	60	238	160.00
7	120–150	52	75	42	74	262	175.00
8	150–200	57	90	47	76	391	220.00

OIL FILTERS

UNIT TYPE

The dirty oil enters the waste oil receptacle and passes through small perforations, then flows horizontally to the two filtering cylinders. During this process the heavy impurities in the oil fall by gravity into the sediment pan, and do not clog up the filtering cloth as it enters the filtering cylinders. After passing through a quantity of animal bone-black the oil is conducted by two tubes to the bottom of filter where by action of plates, it is spread out into a thin film and washed by the water, which removes any remaining impurities. Filter can be flushed out any time by opening gate valve connecting with sewer. Unit type filtering systems can be installed and operated at first without being connected to an oiling system and if an oiling system is added to the plant at some future time, pipe connections can be made to filter without expense. To clean filter, it is not necessary to shut down the whole system and disconnect pipe. In multi-units one unit at a time is cleaned while remaining unit or units handle the oil. Single units can be cleaned by unscrewing and cleaning one cylinder at a time.

Bodies are made of one sheet of heavy iron riveted to a heavy wrought iron frame. All seams are lapped, riveted, tinned and soldered. Upper and lower part of filtering cylinders are made of heavy cast iron, nickel-plated on top; the tubes are of wrought iron; the fittings painted dark blue with gold decorations.

Fig. 3344

SINGLE UNIT

Designed especially for power plants requiring a small filter.

NOS.	Capacity: Filtering Capacity, Gals.	Capacity: Dirty Oils, Gals.	Capacity: Pure Oils, Gals.	Length, Inches	Weight Each, Lbs.	Each
10	100–150	10	50	24	165	$100.00
15	250–400	20	90	42	325	160.00

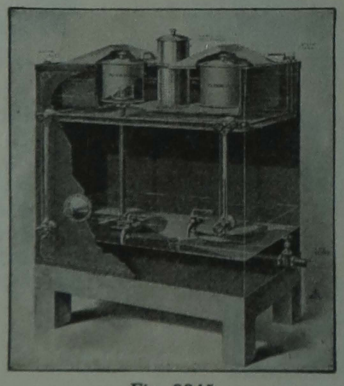


Fig. 3345

DOUBLE UNIT

In many power plants, two kinds of oil are required to be filtered. This filter is composed of two units which operate the same as regular units. Each unit operates independently of the other so that two kinds of oil can be filtered at the same time.

Each

NO. 16—Filtering Capacity, 500 to 800 Gallons; Dirty Oil Chamber, Capacity, 40 Gallons; Pure Oil Chamber, Capacity, 180 Gallons; Length Each, 84 Inches; Weight Each, 650 Lbs. $320.00

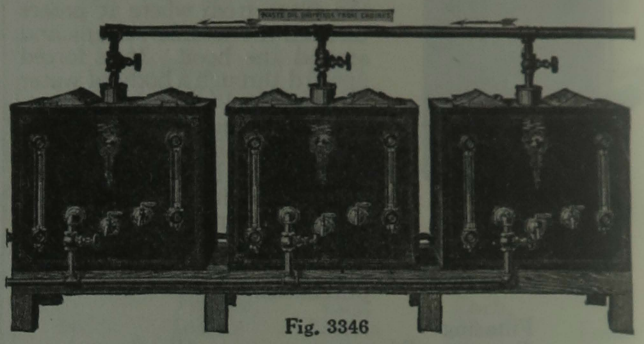


Fig. 3346

THREE UNIT

Any number of units can be added and used in connection with or independent of an oiling system. Recommended for use with steam turbines, large capacity gas and gasolene engines, etc.

UNITS

NOS.	No. of Units	Capacity: Filtering Capacity, Gals.	Capacity: Dirty Oil, Gals.	Capacity: Pure Oil, Gals.	Length, Inches	Weight Each, Lbs.	Each
17	3	750–1200	60	270	126	975	$480.00
18	4	1000–1600	80	360	168	1300	640.00
19	5	1250–2000	100	450	210	1625	800.00
20	6	1500–2400	120	540	250	1950	960.00

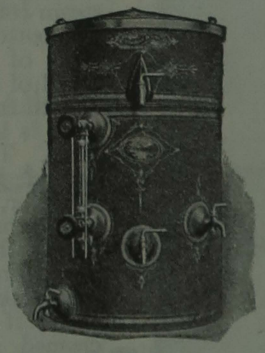


Fig. 3347

AMERICAN

Built along the same lines as unit filters with the exception that it has a round body and has but one filtering cylinder instead of two. Especially adapted for cleaning lard, cylinder, crank case and other heavy grades of oil. The hot water chamber at the top surrounds the unfiltered oil and renders it thin and easy flowing.

NOS.	Capacity: Filtering Capacity, Gals.	Capacity: Dirty Oil, Gal.	Capacity: Clean Oil, Gal.	Dia., Ins.	Hgt., Ins.	Wgt. Each, Lbs.	Each
1	20–30	7	15	18	30	45	$37.50
2	5–10	3	6	12	26	24	25.00
3	40–50	19	30	24	36	82	75.00
4	60–70	36	72	30	54	163	90.00

Price of Larger Sizes on Application

PRESSURE GAUGES

Standard Pressure Gauges of this type are for use with air, gas, water, steam or fluid pressures. Not suitable for use with ammonia or any fluid that brass will not withstand.

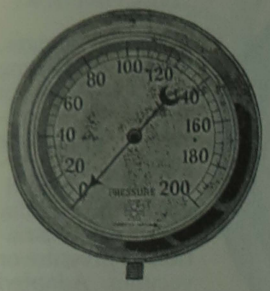


Fig. 3348

Movements are mounted direct on socket and cannot be thrown out of adjustment when gauge is screwed into position. 1½ to 3-inch dial made without flange. Larger sizes have flanged backs. Always connect with a siphon when used with steam. 1½-inch dial has stamped case. All other sizes have heavy cast case. Should be graduated to about double the highest working pressure.

Size, Inches	Weight Each, Lbs.	Iron case Brass Ring, Each	Iron case N. P. Ring, Each	Finished Brass Case, Each	Finished N. P. Case, Each	Finished Brass Deep Case, Each	Finished N. P. Deep Case, Each
12	20½	$50.00	$51.50	$75.00	$79.00	$80.00	$84.00
10	12¼	32.00	33.00	40.00	43.00	44.00	47.00
8½	8¼	22.00	22.75	30.00	32.50	33.50	36.00
6¾	6	16.00	16.60	20.00	22.00	23.00	25.00
6	3¾	13.00	13.50	16.00	17.50	....	....
5½	3½	10.00	10.25	12.00	13.25	....	....
5	1¾	8.00	8.20	11.00	12.00	....	....
4½	1⅛	8.00	8.20	10.00	11.00	....	....
3½	⅝	7.00	7.18	9.00	9.75	....	....
3	¾	6.00	6.15	8.00	8.60	....	....
2½	½	6.00	6.15	8.00	8.60	....	....
2	¼	6.00	6.15	8.00	8.60	....	....
1½	⅛	....	....	8.00	8.60	....	....

Note.—Sizes 1½ to 6 inches have male pipe connections. 6¾ to 12 inches have female pipe connections. Sizes 1½ to 2 and 2½ inches have ⅛-inch pipe connection. All others have ¼ inch pipe.

VACUUM GAUGES

Standard Vacuum Gauges are generally graduated to 30 inches vacuum. Movements are mounted direct on socket and cannot be thrown out of adjustment when gauge is screwed into position. 2 to 3-inch dial made without flange. Larger sizes have flanged backs. Can be made with connection at back of case when so ordered. Vacuum gauges have heavy cast case.

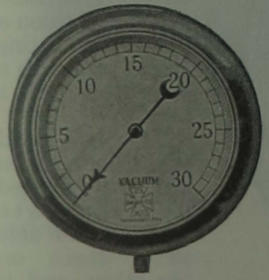


Fig. 3349

Size, Inches	Weight Each, Lbs.	Iron Case Brass Ring, Each	Iron Case N. P. Ring, Each	Finished Brass Case, Each	Finished Brass N. P. Case, Each	Deep Case, Each	N. P. Deep Case, Each
12	20½	$50.00	$51.50	$75.00	$79.00	$80.00	$84.00
10	10¼	32.00	33.00	40.00	43.00	44.00	47.00
8½	8¼	22.00	22.75	30.00	32.50	33.50	36.00
6¾	6	16.00	16.60	20.00	22.00	23.00	25.00
6	3¾	13.00	13.50	16.00	17.50	....	....
5½	3½	10.00	10.25	12.00	13.25	....	....
5	2¾	8.00	8.20	11.00	12.00	....	....
4½	2¼	8.00	8.20	10.00	11.00	....	....
3½	1½	7.00	7.18	9.00	9.75	....	....
3	¾	6.00	6.15	8.00	8.60	....	....
2½	½	6.00	6.15	8.00	8.60	....	....
2	¼	6.00	6.15	8.00	8.60	....	....

COMPOUND GAUGES

Compound Pressure and Vacuum Gauges have a double scale, one showing pounds pressure per square inch and the other vacuum in inches. Used largely on vacuum heating systems and compound steam engines.

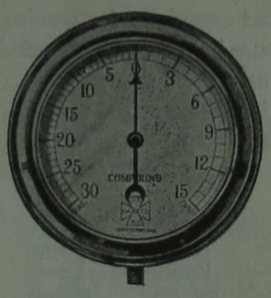


Fig. 3350

Movements are non-corrosive and mounted direct on socket and cannot be thrown out of adjustment when gauge is being screwed into position. Can be made with connection at back of case. Standard graduation, 15 pounds pressure and 30 inches vacuum. Always connect with a siphon. 2 to 3-inch dial made without flange. Larger sizes have flanged backs. Compound pressure and vacuum gauges have heavy cast case. Pressure side of compound gauges should be graduated to about double the highest pressure.

Size, Inches	Weight Each, Lbs.	Iron case Brass Ring, Each	Iron case N. P. Ring, Each	Finished Brass Case, Each	Finished N. P. Case, Each	Finished Brass Deep Case, Each	Finished N. P. Deep Case, Each
12	20½	$60.00	$61.50	$80.00	$84.00	$85.00	$89.00
10	12¼	40.00	41.00	50.00	53.00	53.00	57.00
8½	8¼	30.00	30.75	40.00	42.50	43.50	46.00
6¾	6	20.00	20.60	25.00	26.00	28.00	30.00
6	3¾	16.00	16.50	20.00	21.50	....	....
5½	3½	14.00	14.25	16.00	17.25	....	....
5	2¾	14.00	14.25	16.00	17.25	....	....
4½	2¼	12.00	12.20	14.00	15.00	....	....
3½	1½	10.00	10.18	12.00	12.75	....	....
3	¾	9.00	9.15	11.00	11.60	....	....
2½	½	9.00	9.15	11.00	11.60	....	....
2	¼	9.00	9.15	11.00	11.60	....	....

Note.—Sizes 2 to 6 inches have male pipe connections; 6¾ to 12 inches have female pipe connections; Sizes 2 and 2½ inches have ⅛-inch pipe, all others ¼-inch.

ALTITUDE GAUGES

Standard Altitude Gauges are used to indicate the height of water in tanks, reservoirs, etc.; also in connection with hot-water systems of heating. The extra hand shown is painted red, is adjustable, and set by the user at the pressure it is desired to maintain.

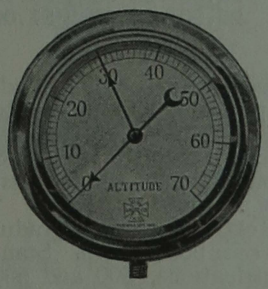


Fig. 3351

Movements are mounted direct on socket and cannot be thrown out of adjustment when gauge is screwed into position. Can be made with connection at back of case. Standard graduation, 70 feet. Altitude Gauges have heavy cast case. Should be graduated to double the highest working pressure.

Size, Inches	Weight Each, Lbs.	Iron case Brass Ring, Each	Iron case N. P. Ring, Each	Finished Brass Case, Each	Finished N. P. Case, Each	Finished Brass Deep Case, Each	Finished N. P. Deep Case, Each
12	20½	$60.00	$61.50	$80.00	$85.00	$85.00	$89.00
10	12¼	40.00	41.00	50.00	53.00	54.00	57.00
8½	8¼	30.00	30.75	40.00	42.50	43.50	46.00
6¾	6	20.00	20.60	25.00	27.00	28.00	30.00
6	3¾	16.00	16.50	20.00	21.50	....	....
5½	3½	14.00	14.25	16.00	17.25	....	....
5	2¾	12.00	12.20	14.00	15.00	....	....
4½	2¼	12.00	12.20	14.00	15.00	....	....
3½	1½	10.00	10.18	12.00	12.75	....	....

Note.—Furnished with male thread; for ¼-inch pipe connection.

PRESSURE GAUGES

Movements are non-corrosive and are mounted direct on socket. Cannot be thrown out of adjustment when gauge is being screwed into position.

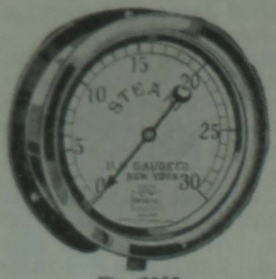


Fig. 3352

STEAM

Adapted especially for service in the house heating boiler trade. Cases are heavy cast iron. Standard graduation, 30 pounds. Must be connected with a siphon. Male connection.

Size, Inches	Size Pipe, Inches	Weight Each, Lbs.	Brass Ring, Each	N. P. Ring, Each
5	¼	3	$8.00	$8.20
4½	¼	2½	8.00	8.20
3½	¼	1¼	7.00	7.18

HYDRAULIC

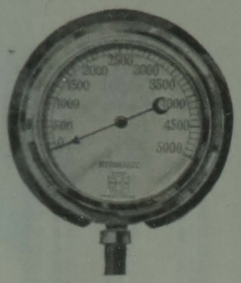


Fig. 3353

Heavy cast case. Should be graduated to about double the highest working pressure.

Springs are bored from best quality tool steel. Sockets have hexagon nut. Standard graduations, 1,000, 2,000, 3,000, 5,000 and 10,000 pounds. Small extra charge when graduated to over 10,000 pounds. Can be made with check valve in socket and with maximum hand at small extra charge. Can be graduated in both pounds per square inch and tons on a given ram.

Size, Inches	Size Pipe, Inches	Weight Each, Lbs.	Iron Case Brass Ring, Each	Iron Case N. P. Ring, Each	Brass Case Finished, N. P., Each	Brass Case Finished, N. P., Each
12	½	21	$110.00	$111.50	$125.00	$129.00
10	½	13	90.00	91.00	100.00	103.00
8½	½	9¼	70.00	70.75	80.00	82.50
6¾	½	6¾	50.00	50.60	60.00	62.00
6	½	5¼	35.00	35.50	40.00	41.50
5	½	3½	30.00	30.50	35.00	36.00
4½	½	2¼	25.00	25.50	30.00	31.00

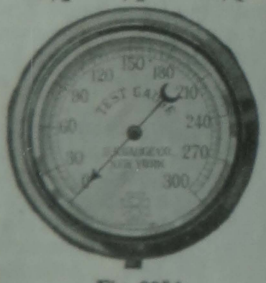


Fig. 3354

TEST

For extreme accuracy in readings of pressure. Largely used to test other gauges. Heavy cast brass case. Should be graduated to about double the highest working pressure.

Small extra charge when graduated to over 500 pounds. Standard graduations, 300 and 500 pounds. 2½ and 3-inch dial made without flange. Larger sizes have flanged backs. Must be connected with a siphon when used with steam.

Size, Inches	Size Pipe, Inches	Weight Each, Lbs.	Finished Brass Case, Each	N. P. Case, Each
10	¼	12¼	$50.00	$53.00
8½	¼	10½	40.00	42.50
6¾	¼	6	30.00	32.00
6	¼	4¾	25.00	26.50
5½	¼	3½	20.00	21.25
4½	¼	2¾	16.00	17.00
3½	¼	1¼	14.00	14.75
3	¼	1	14.00	14.60
2½	⅛	1	14.00	14.60

Note.—Sizes 2½ to 6 inches furnished with male pipe connections; sizes 6¾ to 10 inches furnished with female pipe connections.

PRESSURE GAUGES

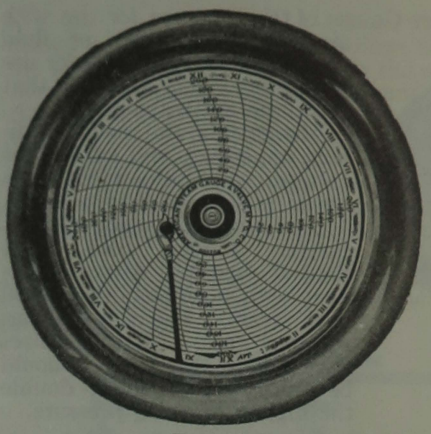


Fig. 3355

RECORDING

These gauges, in cases matching exactly those of standard pressure indicating gauges, are furnished for recording on a circular chart any variation of pressure or vacuum. Adapted to steam, air, gas oil, water, ammonia or hydraulic pressures.

The high-grade clock movements used are a feature which will readily appeal to all as one of great value, and should be given great consideration in selecting an instrument of this sort. These movements are enclosed in dust-proof cases.

The fountain pen furnished with the Recorder is also an important feature, as it requires filling but once a month.

Furnished with a year's supply of charts, one bottle of ink and filler. The chart in most general use is the 24-hour, but special charts for other periods of time can be supplied.

Size Dial, Inches	Weight Each, Lbs.	Iron Case N. P. Ring, Each	Brass Case Shallow, Each	Brass Case Deep, Each
12	15	$76.00	$85.00	$95.00
10	12½	58.00	65.00	72.00
8½	11	44.00	50.00	55.00
6¾	10	36.00	40.00	45.00

Nickel Plated gauges take the same list as brass.

COMBINED PRESSURE AND RECORDING

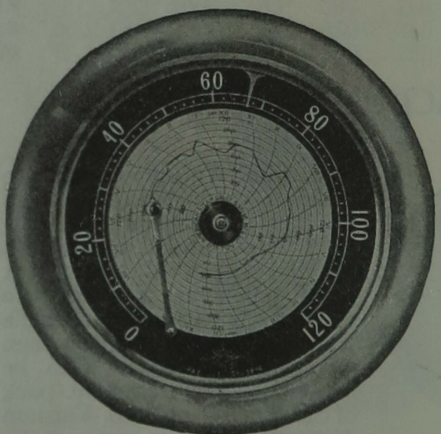


Fig. 3356

This gauge performs the same duty as the plain Recorder—also having the added feature of a regularly graduated metal dial as on a plain indicating gauge, and with a separate index hand.

This hand and the recorder pen arm are operated by separate springs. One acts as a check on the other, and if any difference exists between the reading of the recorder and the pressure indicated by the index hand, it will be at once apparent to the operator.

This gauge has the same high-grade clock movement as plain recorder, also same type fountain pen; and is adapted to steam, air, gas, oil, water, ammonia or hydraulic pressures.

Furnished with a year's supply of charts, one bottle of ink and filler.

Size Dial, Inches	Weight Each, Lbs.	Brass or Nickel Plated, Each
12	16½	$100.00
10	14	75.00
8½	12	60.00

STEAM GAUGE SIPHONS

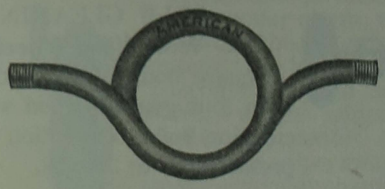


Fig. 3357

Should be used with pressure gauges under steam to prevent steam from entering gauge springs; made with ¼-inch pipe connections.

	Iron, Each	Brass, Each	Nickel Plated, Each
NO. 517—Weight Each, 6 Ozs.	$0.25	$1.00	$1.50

HAND PULLERS

For Pressure Gauges

For removing index hands of gauges.

Made of brass, nickel plated. No. 304 is for gauges up to 6¾ inch; No. 305 is for larger sizes.

Fig. 3358

No. 304

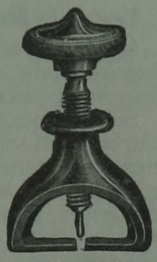


Fig. 3359

NO. 305

	Each
NO. 304—Weight Each, ¼ Lb.	$1.50
NO. 305—Weight Each, .. Lb.	2.00

GAUGE COCKS

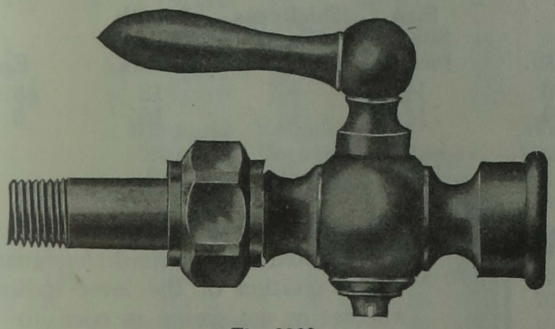


Fig. 3360

LEVER HANDLE—UNION

Made of brass; with male and female ¼-inch pipe connections.

	Brass, Each	Nickel Plated, Each
NO. 307—	$1.50	$2.00

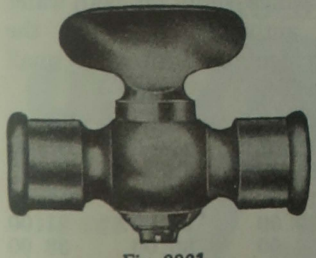


Fig. 3361

T-HANDLE

Made of brass with ¼-inch pipe connection.

	Brass, Each	Nickel Plated, Each
NO. 306—Female	$0.50	$0.75
NO. 308—Male and Female	0.85	1.10

HYDRAULIC GAUGE COCKS

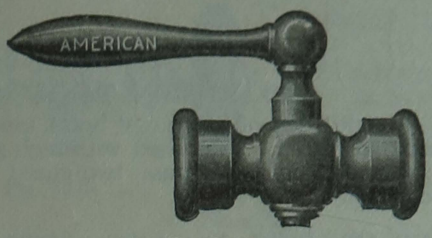


Fig. 3362

Made of brass with ½-inch pipe connections; lever handle.

	Each
NO. 296—Weight Each, ¾ Lbs.	$14.00

HYDRAULIC CHECK VALVES

For Hydraulic Pressure Gauges

Made of special brass with ½-inch pipe connections. No. 294 is for pressures up to 2000 Lbs. No. 295 is for pressures higher than 2000 Lbs.

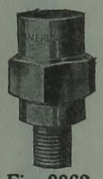


Fig. 3363

NO. 294

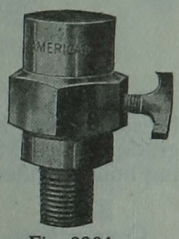


Fig. 3364

NO. 295

	Each
NO. 294—Weight Each, ¾ Lbs.	$6.00
NO. 295—Weight Each, 1 Lb.	8.00

WATER GAUGES

REFLEX TYPE

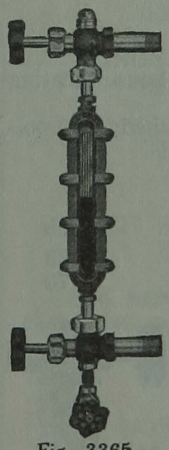


Fig. 3365

The amount of water can always be plainly seen in this gauge, as it shows as a black liquid and the steam shows a strongly contrasting silver white.

Imported glass of the best heat resisting grade is used and it is not necessary to have the usual guard since the glass will not fly out and injure the eyes of the engineer or fireman. Gauge can be kept wide open so that the danger of corrosion is eliminated. The glass will withstand the influences of heat, cold or high steam pressure. Bodies are of high grade cast bronze and are designed to withstand the severe pressures and usage to which a water gauge is subjected. Bodies are reinforced on the interior in order to resist a tendency to spread when bolts are tightened in making tight joints.

NOS.	Length Body, Inches	Distance between Nuts of Stuffing Boxes, Inches	Weight Each With Fittings, Lbs.	Gauge Complete, Each	Gauge Only, Each
0	4½	6 — 7	12½	$26.00	$10.00
1	5⅜	7 — 8	13½	28.00	12.00
2	6⅜	8 — 9	14½	32.00	16.00
3	7¼	9 —10	15½	36.00	20.00
4	8¼	10 —11	16½	40.00	24.00
5	9⅜	11 —12¼	17½	44.00	28.00
6	10¾	12¼—13½	18½	52.00	32.00
7	12	13½—15	19½	60.00	40.00
8	13½	15 —16	20½	65.00	45.00
9	14¼	16 and over	21½	70.00	50.00

Unless otherwise specified, ⅝-inch fittings will be sent. ½-inch and ¾-inch fittings can be furnished if so desired.

WATER GAUGES

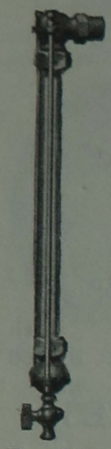


Fig. 3366

EXPANSION TANK

Round body of rough cast brass, sand blasted and lacquered. Furnished with high grade imported Scotch gauge glass; two guard rods; pet cock only.

	Each
NO. 150—Boiler Connection, ½ Inch; Gauge Glass, ⅝x12 Inches	$2.60

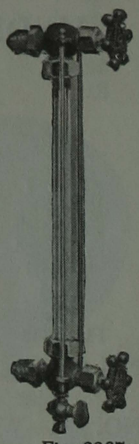


Fig. 3367

SELF-CLEANING
Iron Wheels
NO. 151

Round rough cast brass body; two polished brass guards; iron wheels; pet cock; high grade imported Scotch gauge glass; self-cleaning boiler connection cocks.

Boiler Connections, Inches	Gauge Glass, Inches	Each
⅜	⅝x10	$2.75
½	⅝x12	3.00
¾	¾x16	4.50

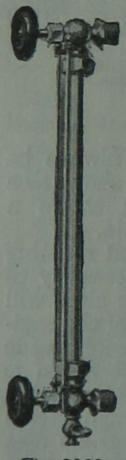


Fig. 3368

HOUSE HEATING TYPES
With Wood Wheels
NO. 154

For use on low pressure house heating boilers.

Round cast brass body, polished; two polished brass guards; wood wheels.

Boiler Connections, Inches	Gauge Glass, Inches	Each
⅜	⅝x10	$3.25
½	⅝x12	3.75

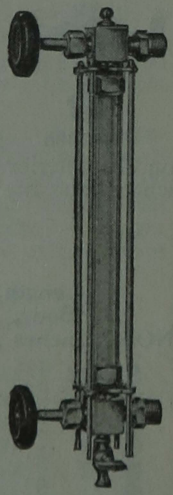


Fig. 3369

SELF CLEANING

NO. 155

Has polished square body of cast brass; four polished brass guards; wood wheels; self-cleaning boiler connection cocks.

Boiler Connections, Inches	Gauge Glass, Inches	Each
½	⅝x12	$6.00
¾	¾x16	8.00

Note.—Water gauges with wood wheels will be furnished with iron wheels when so specified.

All above gauges packed complete in long narrow boxes or, when desired, the glasses and guards will be packed separately and the gauge arms packed in small boxes.

WATER GAUGES

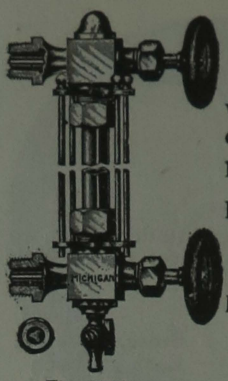


Fig. 3370

SELF CLEANING
With Wood Wheels

Square body of polished cast brass with four guards; wood wheels; self-cleaning boiler connection cocks. For pressures up to 200 lbs.

NO. 16 G4—Boiler Connections, ½ Inch; Gauge Glass, ⅝x 12 Inches	$6.00
NO. 16 G5—Boiler Connections, ¾ Inch; Gauge Glass, ¾x16 Inches	8.00

SAFEGUARD AUTOMATIC
Tested to 300 Lbs. Pressure

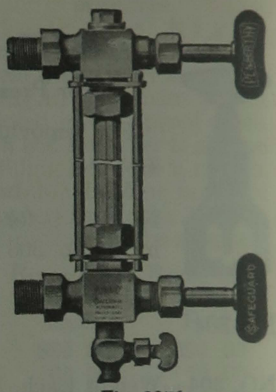


Fig. 3371

Operates on any pressure. Square body of high grade cast bronze; polished; wood wheels.

Self-cleaning by the action of the blow-off vibrating balls. The cleaning stem in lower shank goes all the way through into the boiler, absolutely preventing opening from ever being closed by scale, etc. Equipped with special slow opening dripless pet cock. Balls cannot seat unless glass is broken, because the upper ball seat is designed to leak, which is necessary to the perfect operation of an automatic gauge, by preventing a false water level from being shown. Lugs are cast in the body to support ball in lower arm in case stem is removed. Has cap in top for replacing gauge glass.

NOS.	Size Shank, Inches	Thickness Glass, Inches	Length Glass, Inches	Each
40	½	⅝	12	$5.00
50	¾	¾	16	6.50

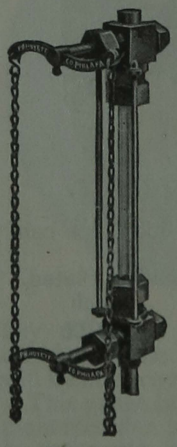


Fig. 3372

CHAIN LEVER

Square body of cast brass, polished nickel plated or rough finish; four guards.

The position of the lever indicates whether or not gauge is open to the boiler; brass control chain permits operation of the gauge from the floor.

Prices include glass and brass rods for gauge centers up to 18 inches and safety brass chain to operate gauge 10 feet from floor.

Can be equipped with automatic attachment which shuts off both water and steam automatically, when the gauge is accidentally broken, at small increase in price.

Boiler Connections, Inches	Gauge Glass, Inches	Polished Brass, Each	Nickel Plated, Each	Rough Brass, Each
½ or ¾ Reg.	¾	$12.00	$14.00	$11.00
¾ Ex. Heavy	¾	22.00	24.00	21.00
*¾	¾	34.00	36.00	33.00

*Heavy Marine pattern with 4x$1\frac{1}{16}$ inch flange. Extra Heavy pattern will stand 375 pounds working pressure.

SAFETY WATER COLUMNS

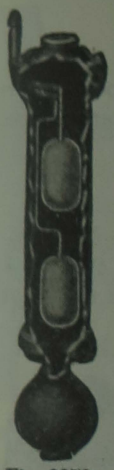


Fig. 3373

Fig. 3374

These columns are of two kinds—the low water alarm, which whistles only when the water line reaches the center of the lower gauge cock; and the combined high and low water alarm, which whistles when it reaches the center of either the lower or the upper gauge cock. They have a sediment chamber, providing protection against the danger occasioned from sediment.

In the low water alarm, the bell crank lever connects the valve with the float, which by reason of its buoyancy presses upward, holding the valve closed so long as the water line is above the lower gauge cock, but which, by reason of its weight, opens the valve, thus blowing the whistle, whenever the water line goes below that point.

The low water part of the combined high and low water alarms is like the low water alarm, the float rod being bent so as to pass around behind the upper float. The high water alarm is simply the low water alarm reversed.

GENERAL DIMENSIONS

Steam and Water Conn., Inches	Blow Off, Inches	Gauge Glass, Inches	Size Gauge Cock, Inches	Center Conn. to Top Column, Inches	Water Column, Diam. Inches	Length Over All, Inches
Combined High and Low Water Alarms						
1	½	⅝x12	½	16	3¾	23¼
1¼	¾	⅝x12	¾	19¾	5	28¼
1¼	¾	¾x16	¾	20½	4¼	29½
1½	¾	¾x19	¾	26	5¼	36
1½	1	¾x26	¾	33½	5¼	44
1½	1	¾x30	¾	37¾	5	48
1½	1	¾x36	¾	52½	5	64
1½	1	¾x42	¾	58½	5	70
Low Water Alarms						
1	½	⅝x12	½	16	3¾	23¼
1¼	¾	¾x14	¾	18¼	4¼	27¼
1½	¾	¾x19	¾	26	5¼	36

NOS.	Kind and Size of Boiler, Inches	Variation Between Alarms, Inches	Columns Only, Each	Water Gauge and Cock, Each
Combined High and Low Water Alarms				
1	36x54	6	$28.00	$7.00
1½	36x54	6	28.00	7.00
5	54x72	8	30.00	10.00
7	Water Tube	12	35.00	10.00
9	Vertical	18	40.00	10.00
11	Vertical	24	42.50	12.50
13	Vertical	30	45.00	20.00
15	Vertical	36	50.00	20.00
Low Water Alarms				
2	36x54	....	$25.00	$7.00
6	54x72	....	28.00	10.00
8	Vertical	....	35.00	10.00

GAUGE COCKS

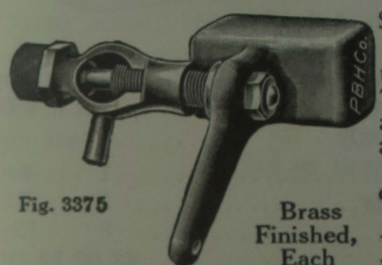


Fig. 3375

Self-Closing—Weighted.

A pull from any distance opens the cock. The weight, quickly adjustable, closes it automatically.

No springs to rust or break.

Quickly renewable valve pencil of specially prepared, long-lasting metal.

	Brass Finished, Each
Sizes ½ or ¾ Inch.....	$2.50

COMPRESSION GAUGE COCKS

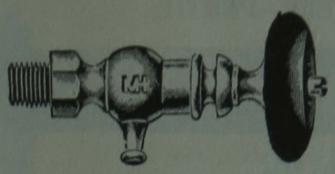


Fig. 3376

REGRINDING

The valve seat is loose, thus facilitating quick and easy regrinding.

Made of brass, well finished.

NOS.	Size Pipe, Inches	Each
10	⅜	$2.35
11	½	2.25
12	¾	2.70

SELF-CLEANING

Wood wheels, without stuffing box. Made of brass, nickel plated.

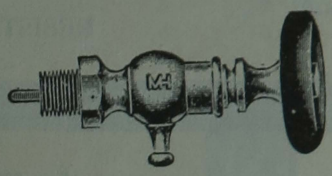


Fig. 3377

NOS.	Size Pipe, Inches	Each
13	⅜	$1.05
14	½	1.10
15	¾	1.35

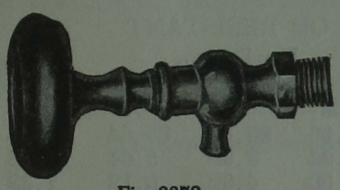


Fig. 3378

PLAIN

Made of cast brass; highly polished; wood handle; without stuffing box.

NOS.	Size Pipe, Inches	Each
16	⅜	$1.10
17	½	1.20
18	¾	1.35

WITH STUFFING BOX

Wood handle. Made of cast brass, nickel finish.

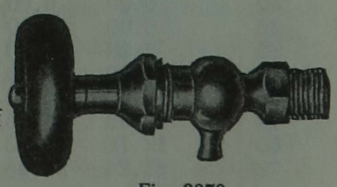


Fig. 3379

NOS.	Size Pipe, Inches	Each
19	⅜	$1.20
20	½	1.30
21	¾	1.45

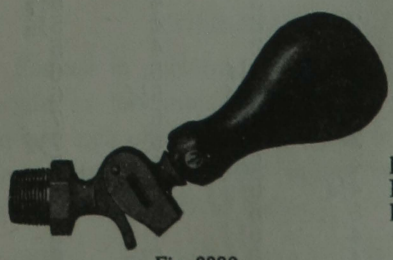


Fig. 3380

WEIGHTED TYPE

NO. 120 "C"

With weighted ball handle and lead seat. Furnished with iron handle.

NOS.	Size Pipe, Inches	Iron Ball, Each
3	⅜	$0.50
4	½	.55
5	¾	.60

GAUGE GLASSES

MONCRIEFF—PERTH

Fig. 3381

Suitable for use with steam pressures up to 200 pounds. The life of gauge glasses can be materially lengthened by careful packing. Glass should not be too large for glands; gauge cocks should be perfectly true and steam turned on very slowly. Glasses run from 1/64-inch to 1/16-inch under size.

RESISTANT

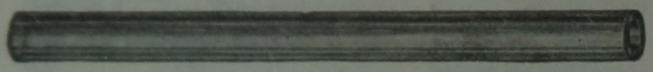


Fig. 3382

A scientific glass, the result of experiments to obtain a glass that would be alkali resistant and that would withstand quick and extreme temperature changes.

Absolutely proof against discoloration and will stand extreme temperatures without breaking.

MONCRIEFF OR RESISTANT

Length, Inches	Per Dozen, External Diameter, Inches ½	⅝	¾	⅞	1
10	$3.00	$3.00	$3.60	$5.04	$6.12
11	3.24	3.24	3.96	5.64	6.72
12	3.60	3.60	4.32	6.12	7.32
13	3.84	3.84	4.80	6.60	7.92
14	4.20	4.20	5.16	7.08	8.52
15	4.44	4.44	5.52	7.56	9.12
16	4.80	4.80	5.88	8.16	9.72
17	5.04	5.04	6.24	8.64	10.32
18	5.40	5.40	6.60	9.12	10.92
19	5.64	5.64	7.08	9.60	11.52
20	6.00	6.00	7.44	10.20	12.12
22	6.60	6.60	8.16	11.16	13.44
24	7.20	7.20	8.88	12.12	14.64
30	9.00	9.00	11.16	15.24	18.24
36	10.80	10.80	13.44	18.24	21.96
48	14.52	14.52	18.00	24.36	29.16
60	18.12	18.12	22.56	30.48	36.48
72	21.84	21.84	27.12	36.48	43.80

Length, Inches	Weight per Dozen, Lbs. External Diameter, Inches ½	⅝	¾	⅞	1
10	1	2	2	3½	3
11	1½	2	3	3	4
12	1	2	3	3¾	4¾
13	1¾	2	3	4	5½
14	1	2	3	4	5½
15	2	3	3	4	5
16	2¼	3¼	4¼	5	6
17	2	3	4½	5¼	6
18	2½	3	4¾	5	7
19	2	3	5	5	7½
20	2¾	4	5¼	6¼	7
21	2	4¼	5½	6½	8¼
22	3½	5	5	6	8
23	3	4	6½	7	9
24	3	4	6	7½	9½

On lengths not regular, charged at price of next larger tubes of same diameter; ½, ⅝, ¾ and ⅞-inch diameter over 24 inches long and all 1-inch and larger tubes, are subject to a different discount than the smaller sizes.

All Above, Half Dozen in a Package

GAUGE GLASS WASHERS

Made of red rubber. Furnished in Square or Round Type.

Fig. 3383

Size, Inches	½	⅝	¾
Weight per Gross, Ounces	8	9	10
Per Dozen	$0.50	0.60	0.70

GILBERT'S

Made of soft rubber composition. Packs the connection against leakage and also protects the gauge glass.

Fig. 3384

NOS.	Size Glass, Inches	Depth Cushion, Inches	Width Cushion, Inches	Weight Per Box, Ounces	Per Box
1	½	¼	⅛	3	$0.60
2	⅝	¼	⅛	3	.60
3	¾	⅜	⅛	3	.60
4	1	½	¼	4	.60
5	⅝	5/16	5/16	4	.60
6	¾	¼	¼	4	.60
7	¾	⅜	3/16	5	.60

Note.—Nos. 1, 2, 3, 3 in a Box; No. 4, 6 in a Box; Nos. 5, 6, 9 in a Box; No. 7, 8 in a Box.

GAUGE GLASS CUTTERS

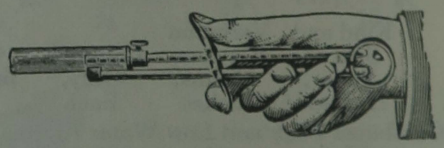


Fig. 3385

In this cutter, the sliding clamp lever can be placed close to the work, thus giving good leverage.

	Each
NO. 10—Length Over All, 9 Inches; Capacity in Length, 6 Inches; Weight Each, 4 Ounces	$2.00

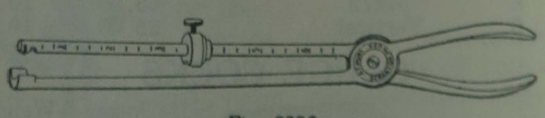


Fig. 3386

The arm with slide stop has a scale in inches and fractions of an inch. Rotary cutter scores the glass so that it will separate evenly and cleanly.

NOS.	1	2
Has Scale up to, Inches	5	7
Weight Each, Ounces	8	12
Each	$2.00	$2.50
Extra Cutters, Each	.10	.10

THERMOMETERS

Fig. 3387

STEAM—STRAIGHT TYPE

Iron nickel plated case, brass oxidized scales, white filled figures. Length stem, 2 inches; ½-inch standard pipe thread. Approximate scale range, 60° to 260° Fahrenheit. Designed only for hot water heating boilers; magnifying mercury tubes.

	Each
NO. 332—Length, 6 Inches; Weight Each, 1⅛ Lbs.	$3.00

STEAM—ANGLE TYPE

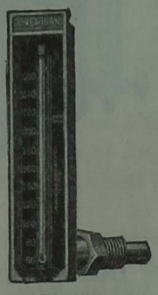


Fig. 3388

Case is made of iron, nickel plated, brass oxidized scales, white filled figures; length stem, 2 inches; ½-inch standard pipe thread. Approximate scale range, 60° to 260° F. Designed only for hot water heating boilers and not adapted or satisfactory for industrial uses. Magnifying mercury tubes.

	Each
NO. 333—Length, 6 Inches; Weight Each, 1¼ Lbs.	$3.50

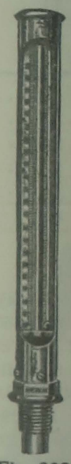


Fig. 3389

HIGH PRESSURE TYPE

For feed water or steam pipe high pressure service.

Cylindrical brass case, oxidized brass scales, white filled figures, magnifying mercury tubes, ¾-inch standard pipe thread. Length of stem, 2½ inches from shoulder of wrench head. Approximate scale range, 0° to 220° Fahrenheit and Reanner.

	Each
NO. 334—Length of Scale, 7¼ Inches; Weight Each, 1½ Lbs.	$8.00

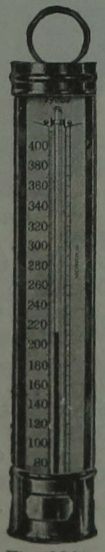


Fig. 3390

OVEN TYPE

For ovens, dry kilns, fruit evaporators, etc., black japanned tin case; heavy brass silvered scales; black filled figures and graduations; magnifying mercury tubes. Range 50° to 350° F.

Size, Inches	10	12	14
Each	$15.00	18.00	22.00

MERCURY GAUGES

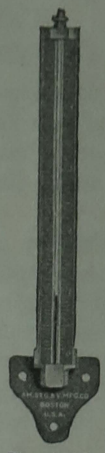


Fig. 3391

FOR PRESSURE

These gauges are used principally to register the pressures of natural and artificial gas. They are also adapted for any other low pressure. The scale is graduated in one-ounce marks.

NO.	Height, Inches	Capacity, Lbs.	Weight Each, Lbs.	Each
331A	14¼	5	2	$5.00
331B	24	10	3	8.00
331C	34	15	4	10.00

SINGLE VACUUM

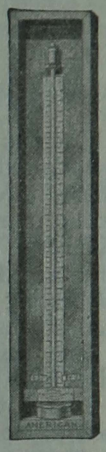


Fig. 3392

For use in laboratories for indicating vacuum; more reliable than the dial gauge; substantially constructed and can be furnished with either mahogany or cherry cases.

	Each
NO. 337—Height, 3 Feet, 4¾ Inches	$....

Price on Application

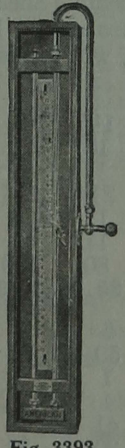


Fig. 3393

DOUBLE VACUUM

Similar to the single vacuum gauge, but furnished with a side connection and a double column for indicating vacuum differentials. Furnished in either mahogany or cherry cases.

	Each
NO. 338—Height, 4 Feet	$.....

Price on Application

COMBINATION

Fig. 3394

For use in pumping stations, to indicate the height in feet and corresponding pounds per square inch of water in reservoir or standpipe. One pound pressure per square inch raises a column of water 27.67 inches.

	Each
NO. 336—Height, 16 Feet, 3 Inches; Weight Each, Lbs.	$.....

Price on Application

FEED WATER HEATERS

NATIONAL

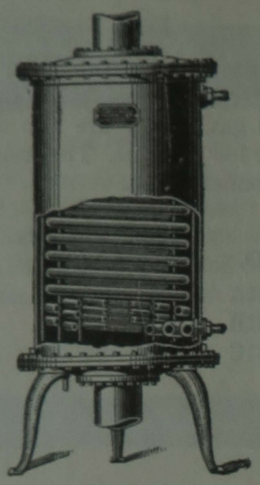


Fig. 3395

Consists of single or manifold coils of seamless drawn brass cased in an iron shell. The feed water for the boiler passes through the coil and is heated by the exhaust steam from the engine. Coils are connected with special gunmetal manifolds, the ends of the coils being inserted and brazed in. Will stand 600 pounds pressure. Method of bracing coils with clamp stays allows for contraction and expansion, and insures rigidity.

The heights of Nos. 3 to 60 include legs. Smaller sizes have no legs.

Nos. 1 to 2½ have exhaust inlet and outlet in top of head. Nos. .05, No. 3 and above have exhaust inlet in bottom and outlet in top of heads unless otherwise ordered. Size of exhaust can be varied to suit requirements. Shells Nos. .05 to 30 are cast iron; other sizes are steel. If heater is to be used in a horizontal position, will furnish saddles instead of legs at same price.

NOS.	.05	1	1½	2
For Boiler, H. P.	5	10	15	20
Feed Pipe, Inches	½	½	½	¾
Exhaust Pipe, Inches	2	2	2½	2½
Height, Inches	10	12	17	18
Diameter, Inches	7	11	11	16
Weight Each, Lbs.	35	65	80	180
Each	$20.00	25.00	35.00	50.00

NOS.	2½	3	4	5	6
For Boiler, H. P.	25	30	40	50	60
Feed Pipe, Inches	1	1	1	1	1
Exhaust Pipe, Inches	3	4	4	4	4
Height, Inches	20	34	36	41	46
Diameter, Inches	19	20	20	20	20
Weight Each, Lbs.	270	350	390	420	475
Each	$60.00	75.00	90.00	110.00	130.00

NOS.	8	10	12	15	20
For Boiler, H. P.	80	100	125	150	200
Feed Pipe, Inches	1	1¼	1½	1½	2
Exhaust Pipe, Ins.	4	5	5	8	8
Height, Inches	51	56	56	60	70
Diameter, Inches	20	22	22	26	26
Weight Each, Lbs.	515	800	850	1150	1300
Each	$160.00	180.00	210.00	250.00	325.00

NOS.	25	30	40	50	60
For Boiler, H. P.	250	300	400	500	600
Feed Pipe, Inches	2	2	2½	2½	3
Exhaust Pipe, Ins.	8	8	10	10	12
Height, Inches	76	84	88	102	101
Diameter, Inches	26	26	36	36	42
Weight Each, Lbs.	1450	1650	1900	2200	2800
Each	$400.00	500.00	600.00	750.00	900.00

FUEL OIL HEATERS

REILLY

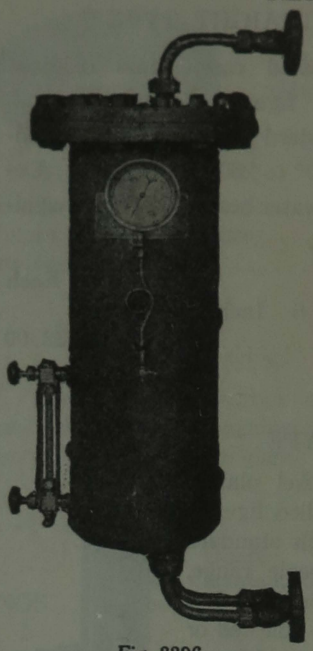


Fig. 3396

To insure proper vaporization and good combustion under the boilers when using fuel oil, it is necessary to preheat the oil no matter what grade of oil is used.

Live steam is used as the heating agent, as sufficiently high temperatures cannot be obtained if exhaust steam is used. The oil is circulated through the coils of the heater and is heated by high pressure steam supplied to the shell.

Shell of close grain cast iron; heads of steel; manifolds of composition; supporting brackets cast on shell; coils are of 1-inch outside diameter, No. 16 Birmingham wire gauge. Are attached to outside manifolds by special connections so arranged that there are no oil joints inside the heater, thus eliminating the possibility of any oil contaminating the steam.

Iron case pressure gauge with siphon and connections and complete water gauge are furnished with the heater.

NOS.	Inside Dia. Shell, Inches	Hgt., Feet and Inches	Size of Connection, Inches: Oil Inlet and Outlet	Steam Inlet	Steam Drain	Weight Each, Lbs.	Each
1	7	4–10⅜	1	1	¾	360	.....
2	12	4–11¼	1½	1¼	1	785	.....
3	13¼	5⅜	2	1½	1	960	.....
4	14⅛	5⅜	2	1½	1¼	1445	.....
6	18	5–1⅜	2½	2	1¼	2055	.....

WATER HEATERS

Fig. 3397

The use of this heater does away with all noise such as otherwise occurs when heating a tank or barrel of water or other liquid with steam. Has no couplings and no loose parts to get out of order. Simply necessary to put a piece of pipe into large end of heater and screw heater on to end of steam pipe, placing same below the surface of the liquid. Will heat quickly and without waste of steam. In order to secure a noiseless operation, it is necessary to use a tank of sufficient capacity.

NOS.	F	G	H	J
Size Pipe Conn., Inches	¼	⅜	½	¾
Discharge Pipe, Inches	⅜	½	¾	1
Capacity, Gallons*	50	60	75	100
Weight Each, Lbs.	¼	½	11/16	¾
Each	$1.50	1.75	2.00	2.50

NOS.	K	L	M	N
Size Pipe Conn., Inches	1	1¼	1½	2
Discharge Pipe, Inches	1¼	1½	2	2½
Capacity, Gallons*	125	175	250	500
Weight Each, Lbs.	1	1¼	2	3¼
Each	$3.00	4.00	5.00	8.00

*Number of gallons of water heated from 70 to 210 degrees in 30 minutes with 70 pounds steam pressure.

INSPIRATORS

HANCOCK

STATIONARY TYPE

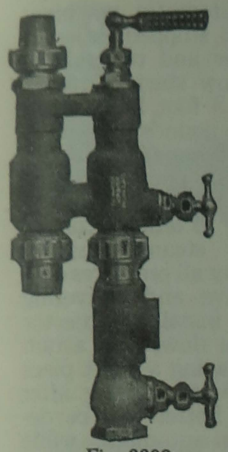


Fig. 3398

For general all-round service. Works with high or low steam pressures on all lifts up to 25 feet, or when taking water under a head, with hot feed water as well as cold. For all steam pressures and for all conditions its operation is the same, and it requires no adjustment for varying steam pressures. Considering the wide range which this instrument has, the construction is simple and most durable.

A lifting apparatus lifts the water and delivers it to the forcing apparatus, which, in turn, forces it into the boiler. The lifting apparatus, acting as a governor, delivers to the forcing apparatus the required amount of water to properly condense the steam under all conditions. The valves are of the simplest kind, and there is nothing to get out of order.

May be used for other purposes when not feeding the boiler. When desired, the lifter side may be used as an ejector for delivering water to a tank or for other purposes.

To operate as a lifter only, open the valve in steam pipe, also valve No. 1 and valve No. 3, and have valve No. 2 closed. Throttle the valve in the steam pipe until the best results are obtained. With a steam pressure of 30 pounds the temperature of the water delivered will be increased about 30 degrees Fahrenheit.

When the lifting and forcing apparatus are both in complete operation, such as when feeding the boiler, the instrument may be used to advantage to force water to a high elevation.

Water may be elevated above the Inspirator about 2½ feet for each pound of steam pressure.

With 45 pounds steam pressure water may be lifted 25 feet and elevated 112½ feet above the inspirator, a total elevation of 137½ feet.

NOS.	Pipe Connections, Inches			Capacity per Hour with 60 Pounds SteamPressure, Gallons	Horse-power		Weight Each, Pounds	Each
	Steam	Suction and Delivery	Overflow		For the Ordinary Type of Boiler and Engine	On a Basis of 30 Pounds Evaporation per Horse-power, Per Hour		
7½	⅜	⅜	¼	60	4 to 6	5 to 8	3⅝	$16.00
8¾	⅜	½	⅜	90	6 to 8	8 to 15	4⅜	18.00
10	⅜	½	⅜	120	8 to 15	15 to 25	4⅜	20.00
12½	½	¾	½	220	15 to 30	25 to 35	7¼	25.00
15	½	¾	½	300	30 to 40	35 to 60	7¼	30.00
17½	¾	1	¾	420	40 to 60	60 to 75	10¼	40.00
20	¾	1	¾	540	60 to 75	75 to 100	10¼	45.00
22½	1	1¼	1	720	75 to 90	100 to 130	17⅛	55.00
25	1	1¼	1	900	90 to 120	130 to 175	17⅛	60.00
30	1¼	1½	1¼	1260	120 to 165	175 to 235	21⅞	75.00
35	1¼	1½	1¼	1740	165 to 230	235 to 300	25½	90.00
40	1½	2	1½	2230	230 to 300	300 to 400	33¾	110.00
45	1½	2	1½	2820	300 to 375	400 to 500	39⅛	125.00
50	2	2½	2	3480	375 to 500	500 to 650	56	150.00
55	2	2½	2	3650	500 to 600	650 to 700	61	175.00

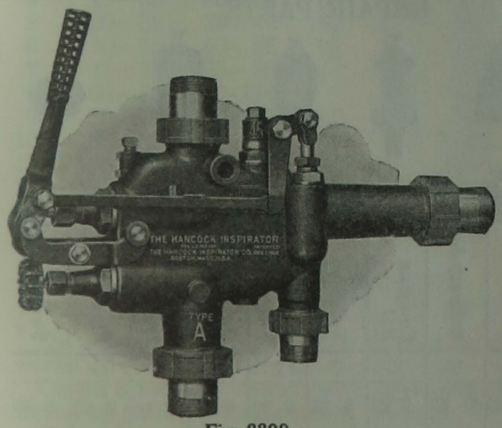


Fig. 3399

TYPE A

Type "A" (horizontal pattern) for large stationary plants, marine boilers, and all boilers carrying extremely high pressures, and wherever it is desired to have the instrument operated by one lever.

The regulating valve, which is directly under the lever, throttles the steam supply to the lifter steam nozzle only, thereby reducing the capacity of the inspirator from the maximum to the minimum without throttling the water supply. This arrangement neither disturbs the suction by creating an increased vacuum in the suction pipe, nor does it impair the effectiveness of the forcing apparatus.

NOS.	Pipe Connections, Inches				Capacity per Hour with 100 Pounds Steam Pressure, Gallons	Horse-power		Weight Each, Pounds	Each
	Steam	Suction	Delivery	Overflow		For the Ordinary type of Boiler and Engine	On a Basis of 30 Pounds Evaporation per Horse-power, Per Hour		
25	1¼	1¼	1¼	1¼	1020	80 to 130	110 to 180	35⅛	$60.00
30	1½	1½	1½	1½	1430	130 to 170	180 to 235	39-3/16	75.00
35	1½	1½	1½	1½	1975	170 to 230	235 to 300	39-3/16	90.00
40	2	2	2	1½	2530	230 to 300	300 to 400	58	110.00
45	2	2	2	1½	3200	300 to 375	400 to 500	58	125.00
50	2	2½	2	1½	3950	375 to 500	500 to 650	73-11/16	150.00
55	2	2½	2	1½	4140	500 to 600	650 to 750	73-11/16	200.00

AUTO-POSITIVE INJECTORS

PENBERTHY

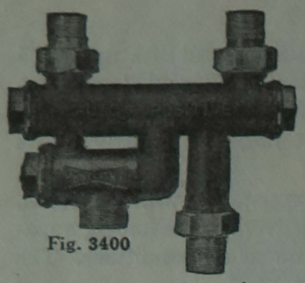


Fig. 3400

Has but five working parts, combining features of a Positive with those of an Automatic Injector. By this combination it is enabled to handle much hotter water and work on higher steam pressure. On a short lift (1 to 3 feet) starts at 20 to 25 pounds steam pressure and operates to 200 pounds pressure, water 74° F. or summer temperature. At winter temperature works on 240 pounds pressure. Vertical lift from 3 feet at 200 pounds pressure to 20 to 23 feet between 65 and 120 pounds pressure. Will deliver hot water supply as follows:

130° to 135° F., according to conditions at 75 to 100 pounds steam pressure.

125° to 130° F., according to conditions, at 50 to 120 pounds steam pressure.

110° to 115° F., according to conditions, at 35 to 150 pounds steam pressure.

90° to 95° F., according to conditions, at 28 to 175 pounds steam pressure.

Under 60° F., 30 to 225 pounds. Under 40° F., 35 to 240 pounds.

By placing stop cock in a short piece of pipe and screwing into overflow, and closing after injector is started, it stops drizzle from overflow. A pressure of 235 pounds can be carried with water at 74° F., where only 200 pounds could be carried without stop cock. Water 6 to 8 degrees hotter can also be handled. This renders Injector Non-automatic while stop cock is closed.

NOS.	H. P., Allowing 7½ to 8 Gals. per H. P., Per Hour	Capacity per Hour 75 to 125 Pounds Steam, 3 Foot Lift		Size Pipe Connections, Ins.	Size Outlet, Ins.	Weight Each, Pounds	Each
		Max.	Min.				
112	5 to 15	120	40	⅜	½	5	$18.00
113	7 to 25	200	60	½	¾	6½	20.00
115	16 to 50	400	130	¾	1	9	30.00
117	28 to 85	675	225	1	1¼	13¼	45.00
119	47 to 145	1125	375	1¼	1½	20	60.00
121	87 to 265	2000	700	1½	2	30½	90.00
123	125 to 400	3000	1000	2	2½	50½	125.00
125	200 to 600	4200	1500	2½	3	59⅛	200.00

REPAIR PARTS

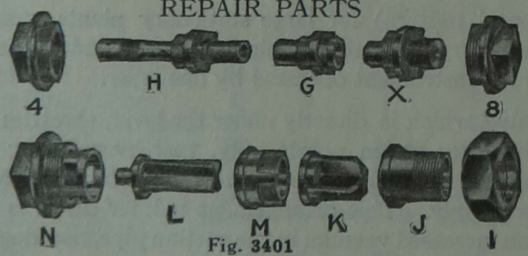


Fig. 3401

NOS	Steam Plug	Steam Jet	Suction Jet	Delivery Jet	Delivery Plug	Overflow Plug	Pressure Valve	Pressure Valve Collar	Vacuum Valve	Coupling Nut	Tail Pipe	Strainer	Tool for Removing Jet
	8	X	G	H	4	N	L	M	K	I	J		
112	$.70	$.40	$.40	$.90	$.60	$.75	$.25	$.30	$.25	$.25	$.25	$.40	$.45
113	.80	.50	.40	1.00	.70	.80	.30	.40	.30	.30	.30	.45	.50
115	.80	.60	.50	1.50	.80	1.00	.45	.60	.45	.40	.40	.50	.60
117	.90	.75	.60	2.00	.90	1.25	.60	.90	.60	.50	.50	.55	.70
119	1.10	.90	.75	3.00	1.10	1.50	.75	1.25	.75	.60	.60	.60	.80
121	1.40	1.00	.85	4.00	1.40	1.75	1.00	1.75	1.00	1.25	.80	.75	.90
123	1.70	1.20	1.00	5.50	1.70	2.00	1.25	2.25	1.25	1.50	1.00	1.00	1.00
125	2.50	2.00	1.50	8.00	2.50	3.00	2.00	3.00	1.75	2.00	1.25	1.50	1.50

In ordering parts give size number; also, if possible, shop number of Injector.

Steam suction and delivery pipe connections are same pipe sizes.

AUTOMATIC INJECTORS

PENBERTHY

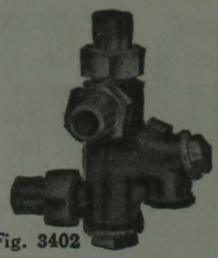


Fig. 3402

Self-starting, automatic machine; if flow of water is stopped, injector will pick up water and re-establish flow to boiler. Low start, 20 to 22 pounds steam on 3 foot lift. Work high, 165 to 170 pounds steam on 3 foot lift. Lifts water 20 to 24 feet on 60 to 80 pounds steam. Water delivered to Boiler at 160° to 212° F., according to temperature of feed water and steam pressure. Water 200° to 212° F. delivered at nearly all pressures over 50 pounds, by throttling suction valve and delivering minimum capacity. It is advisable to install an Injector large enough so that supply can be cut down and attain this result, thereby saving fuel. By placing a short piece of pipe having a stop cock in overflow and closing after Injector has started, water 8° to 10° hotter can be delivered, but Injector is rendered Non-automatic while stop cock is closed.

NOS.	H. P. Based on Ordinary Tubular Boiler.	H. P. Based on 30 Pounds Water per H. P., Per Hour	Pipe Connections, Ins.	Gallons per Hour, 1 to 3 Feet Lift, 60 to 110 Pounds Steam Pressure		Weight Each, Lbs.	Each
				Max.	Min.		
O	3 to 6	4 to 8	¼	60	35	2½	$15.00
OO	4 to 8	6 to 12	⅜	80	45	3	16.00
A	8 to 16	10 to 20	½	135	70	3¾	18.00
AA	12 to 22	15 to 30	½	180	100	3¾	20.00
B	17 to 32	22 to 45	¾	260	140	5¼	25.00
BB	20 to 45	25 to 60	¾	360	180	5¼	30.00
C	40 to 65	45 to 80	1	475	250	8⅜	40.00
CC	45 to 80	50 to 100	1	600	325	8⅜	45.00
D	50 to 100	60 to 135	1¼	800	425	11⅞	55.00
DD	75 to 135	85 to 165	1¼	1000	525	11⅞	60.00
E	100 to 180	125 to 235	1½	1400	740	23½	75.00
EE	115 to 255	150 to 320	1½	1900	850	23½	90.00
F	160 to 320	200 to 400	2	2400	1275	39⅜	110.00
FF	200 to 400	250 to 500	2	3000	1600	40	125.00
G	300 to 500	325 to 600	2½	3600	1785	75	150.00
GG	375 to 600	400 to 750	2½	4200	2150	75	200.00

REPAIR PARTS

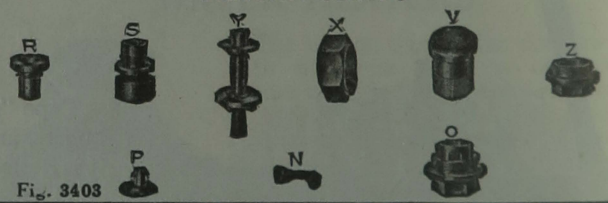


Fig. 3403

NOS.	Steam Jet	Suction Jet	Delivery Jet	Coupling Nut	Tail Pipe	Overflow Cap	Overflow Valve	Overflow Hinge	Plug	Strainer
	R	S	Y	X	V	Z	P	N	O	
O, OO	$.25	$.25	$1.25	$.25	$.25	$.30	$.40	$.10	$.60	$.40
A, AA	.35	.35	1.50	.30	.30	.40	.50	.10	.80	.45
B, BB	.45	.45	2.00	.40	.40	.50	.60	.15	1.00	.50
C, CC	.55	.55	2.50	.50	.50	.60	.75	.15	1.25	.55
D, DD	.65	.65	3.00	.60	.60	.70	.90	.15	1.50	.60
E	.75	.75	3.75	1.25	.80	.80	1.00	.20	1.75	.75
EE	.75	.75	4.50	1.25	.80	.80	1.10	.20	1.75	.75
F	.85	.85	5.50	1.50	1.00	.90	1.25	.20	2.00	1.00
FF	1.00	1.00	6.50	1.50	1.00	.90	1.25	.20	2.00	1.00
G, GG	2.00	3.00	9.00	2.00	1 25	1.50	1.75	.30	4.00	1.50

In ordering parts do not fail to give serial letter and number, which will be found on top of overflow. In referring to or ordering parts, designate them by letter or name as per above.

Steam, suction and delivery pipe connections are same pipe sizes.

AUTOMATIC INJECTORS

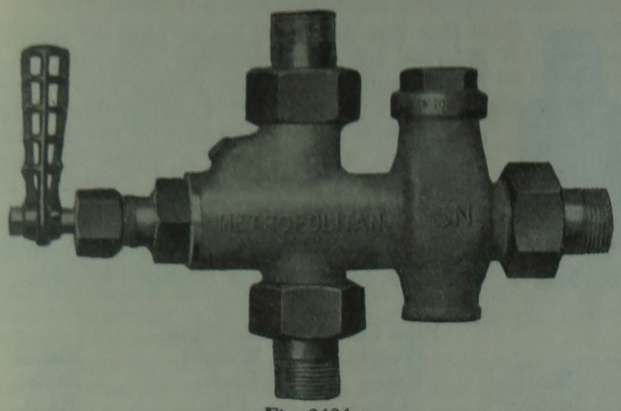


Fig. 3404

MODEL N

Self-contained, automatic, or restarting injector, operated entirely by one handle, and does not require the manipulation of valves in the steam and suction pipes for different steam pressures. This result is obtained by a sliding nozzle. Being absolutely automatic, it will restart after an interruption of the water supply, and is therefore well adapted for service where it is subjected to severe jars. All wearing parts are made of a hard bronze composition; the body and all other parts, except steam valve handle and the nut, are of Bronze composition.

Very hot water can be handled by the Metropolitan Automatic Injector, Model N, by running a small supply of cold water into the suction pipe close to the injector. This cold water supply should be regulated by a valve to reduce the temperature of the water to a point where the injector will handle it.

NOS.	H. P. Based on Ord. Tubular Boiler	H.P. Based on 30 Lbs. Water per H.P. per Hr.	Pipe Connections, Ins.	Size Overflow, Ins.	Gallons per Hr. 2-ft. Lift 80 Lb. Pressure	Wgt. Each, Lbs.	Each
2	4– 6	5– 8	3/8	3/4	60	2 3/4	$15.00
3	6– 8	8– 12	3/8	3/4	80	2 3/4	16.00
3 1/2	8– 15	12– 20	1/2	3/4	120	3 3/16	18.00
4	15– 20	20– 28	1/2	3/4	165	3 3/16	20.00
5	20– 30	28– 40	3/4	1	250	5 1/2	25.00
6	30– 45	40– 55	3/4	1	350	5 1/2	30.00
7	45– 65	55– 80	1	1 1/4	500	8 1/2	40.00
8	65– 80	80–110	1	1 1/4	600	8 1/2	45.00
9	80–100	110–145	1 1/4	1 1/2	800	13 1/2	55.00
10	100–130	145–180	1 1/4	1 1/2	1000	13 1/2	60.00
11	130–170	180–235	1 1/2	2	1300	22 1/4	75.00
12	170–230	235–300	1 1/2	2	1750	22 1/4	90.00
13	230–300	300–400	2	2 1/2	2300	34 5/8	110.00
14	300–375	400–500	2	2 1/2	2850	34 5/8	125.00

WORKING RANGES
WITH FEED WATER AT 72° FAHR.

On a 2-foot lift—Starts with 25 pounds steam pressure, works up to 150 pounds steam pressure.

On an 8-foot lift—Starts with 30 pounds steam pressure, works up to 130 pounds steam pressure.

On a 20-foot lift—Starts with 55 pounds steam pressure, works up to 85 pounds steam pressure.

When not lifting—Starts with 20 pounds steam pressure, works up to 160 pounds steam pressure.

WITH FEED WATER AT 100° FAHR.

On a 2-foot lift—Starts with 26 pounds steam pressure, works up to 120 pounds steam pressure.

On an 8-foot lift—Starts with 33 pounds steam pressure, works up to 100 pounds steam pressure.

On a 14-foot lift—Starts with 55 pounds steam pressure, works up to 80 pounds steam pressure.

When not lifting—Starts with 25 pounds steam pressure, works up to 125 pounds steam pressure.

LOCOMOTIVE INJECTORS

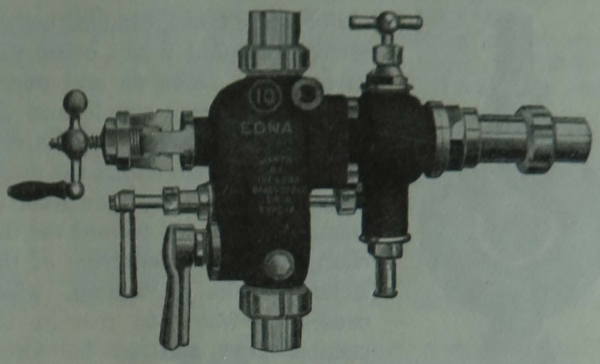


Fig. 3405

TYPE A

Body and fittings made from carefully formulated steam metal and the nozzles from a special formula, which insure strength and durability.

Used on steam locomotives, steamships, stationary boilers, etc.

Universal joints and extension rods for mounting the Injector outside of locomotive cab furnished if desired. Supplied with closed overflow if specified when ordering.

Pipe connections or tail-pieces will be furnished blank, to be threaded for iron pipe or to be bored out for copper pipe, unless otherwise specified when ordering.

NOS.	Capacity Per Hour at 200 Lbs. Pressure, Gallons	Weight, Each, Lbs.	Each Complete
4	570	12 1/2	$56.25
5	930	33	81.25
6	1230	33	87.50
7	1920	50	100.00
8	2340	70	125.00
9	2940	70	137.40
10	3750	82	156.25
11	4150	98	175.00
12	4450	98	187.50

SIZES OF INJECTOR CONNECTIONS

NOS.	Iron Pipe Sizes, Inside Diameter, Inches: Steam	Suction	Delivery	Copper Pipe Sizes, Outside Diameter, Inches: Steam	Suction	Delivery
4	3/4	1	3/4	1	1 1/4	1
5	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
6	1 1/4	1 1/4	1 1/4	1 1/2	1 1/2	1 1/2
7	1 1/2	1 1/2	1 1/2	1 3/4	1 3/4	1 3/4
8	1 1/2	2	2	1 3/4	2 3/4	2
9	1 1/2	2 1/2	2	1 3/4	2 3/4	2
10	2	2 1/2	2	2 1/4	2 3/4	2 1/4
11	2	3	2	2 1/4	3 1/4	2 1/4
12	2	3	2	2 1/4	3 1/4	2 1/4

To operate, open primer by moving jet valve handle from closed position on left side to full open position on the right side. When water appears at overflow, open steam valve handle to full opening; then close primer by moving jet valve handle from right to left side. Regulate water by moving water valve handle toward closed position until water stops at overflow. Always have water valve open before starting injector; to stop, close steam valve.

JET PUMPS

Fig. 3406

For filling tanks, draining cellars, excavations and many other uses in factories, railroads and mines. Operation is very simple and the installation is easy. A relatively small jet of steam enters the pump body in such a manner that its energy is expended toward the discharge. The condensation of this steam creates a vacuum, which causes the water to rise in the suction pipe and so be forced through the discharge.

There are no valves to wear out and dirty, gritty water can be handled as well as clear; pump is self-draining so that it will not be injured by freezing; all parts are interchangeable.

MODEL A

Size Pump, Ins.	Suction Pipe, Ins.	Discharge Pipe, Ins.	Steam Pipe, Ins.	Capacity per M., Gals.	Weight Each, Lbs.	Each
¾	¾	½	⅜	8	4	$8.00
1	1	¾	½	15	6	10.00
1¼	1¼	1	½	20	8	12.00
1½	1½	1¼	¾	30	12	14.00
2	2	1½	¾	40	16	16.00
2½	2½	2	1	50	24	20.00
3	3	2½	1	60	33	24.00
4	4	3	2	250	60	70.00

WATER LIFTERS

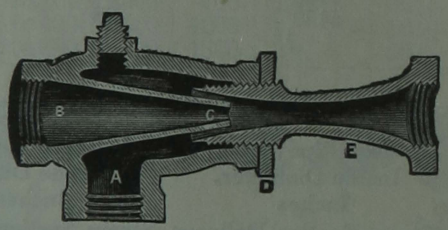


Fig. 3407

An economical substitute for a steam pump. For use on steamboats and places where tanks, vats or pits are to be pumped out or filled. Body made of cast iron, cones fitted with brass. Discharge tubes are all brass.

NOS.	Diameter Suction and Discharge, Ins.	Size Steam Pipe Conn., Ins.	Capacity Water per hr. steam at 50 lbs., gals.	Each
0	¾	⅜	400	$5.00
1	1	½	700	6.00
2	1¼	¾	1100	8.00
3	1½	¾	1600	10.00
4	2	1	3000	12.00
5	2½	1¼	5000	20.00
6	3	1½	7000	25.00

STRAINERS

Fig. 3408

For use on the suction pipe of pumps, drainers, etc., to prevent dirt, scale, and other foreign substances from getting into valves, traps, water lifters, etc. Considerable trouble and expense are often caused by the presence of foreign substances in a steam or water system and a strainer should always be installed on the suction pipe.

Made entirely of brass; body is heavy gauge sheet brass, perforated. Furnished either with hose connection or threaded for pipe.

Size, Inches	Pipe Conn. Weight Each, Lbs.	Hose Conn. Weight Each, Lbs.	Either Style, Each
¾	⅜	11/16	$0.60
1	½	¾	.75
1¼	1	1⅛	1.00
1½	1¼	1⅞	1.70
2	1¾	2⅞	2.20
2½	2 11/16	3	2.35
3	3	3⅛	2.50

CELLAR DRAINERS

AUTOMATIC

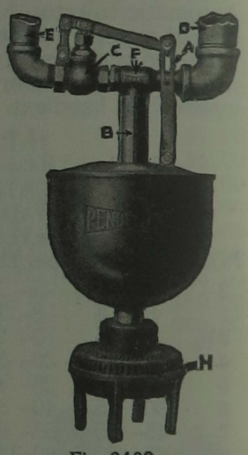


Fig. 3409

An entirely automatic drainer for cellars, etc., operated by water pressure. Made very compact so that it is necessary to construct only a small sump. The whole drainer when installed is under the floor level but all parts are located at the top and are of easy access.

The float is made flat on top and is built around the suction pipe.

The water enters to the suction pipe from the side through a slotted strainer and a foot valve in the suction pipe closes as soon as the drainer ceases operating, holding all the water in the pipes ready for instantaneous starting.

Automatically operated by the float-controlled, quick-opening-and-closing valve which is never partially opened, but allows the ejector to give its greatest efficiency by working to full capacity. The float arms are slotted where they connect to the valve lever, preventing the ejector from operating until the water has raised the float up to the highest point. As the water is ejected, they travel down the length of these slots before the weight of the float affects the valve. This allows the machine to work for longer periods and not so often, thus preventing considerable wear and the leakage and dribbling of water.

NOS.	Supply Pipe, Inches	Discharge Pipe, Inches	Gallons per Hr. 20 to 80 lbs. Pressure, 3 to 8 ft. Elevation Min.	Gallons per Hr. 20 to 80 lbs. Pressure, 3 to 8 ft. Elevation Max.	Weight Each, Lbs.	Each
1	½	1	115	650	18	$25.00
2	¾	1¼	180	1050	22	40.00
3	1	1½	310	1650	37	55.00
4	1¼	2	450	2400	51	80.00
5	1½	2½	600	3200	55	110.00
6	2	3	780	4200	..	160.00
7	2½	3½	1000	5300	..	225.00
8	3	4	1250	6500	..	300.00

STEAM SEPARATORS

Even under the best conditions all steam, when leaving the boilers, contains more or less entrainage, some of it being lifted out directly with the steam, but most of it being carried along in suspension in the steam current.

Water in live steam mains, due to either of these causes, together with that resulting from condensation, becomes an agency of destruction when introduced into the engine cylinder in larger quantities than the clearance will provide for. It is a well known fact that water is practically incompressible, so that when it enters a cylinder of small clearance a wrecked engine is often the result.

Among other causes which give rise to accidents of this kind, besides those already stated, may be mentioned, first, priming of boilers due to impurities in the feed-water supply; the forcing of boilers beyond their normal capacity; and, conversely, sudden demands of the engine for more steam, occasioned by temporary increases of load. A contingency of this kind gives abundant opportunity for water to be lifted out of the boilers and so drawn along with the steam, under great velocity and in considerable quantity, with disastrous results to the engine.

In cases where boilers are operated at nearly full capacity, or where there is danger of water being carried over into the engine in considerable quantities for any of the other reasons above stated, the use of an efficient Live Steam Separator is imperative. Such conditions call for larger receiver capacity than is provided by separators intended for ordinary service.

A large Receiver Separator is absolute in the protection it affords the engine, providing a proper means is furnished for removing the water of condensation through the drain pipe of separator. All Live Steam Separators should have installed on the drain pipe a first-class steam trap, which removes automatically all drainage. Removing the water by hand valve, as is often done, should not be permitted or encouraged, as one instance of neglect or forgetfulness in opening the valve may result in an expensive cylinder accident.

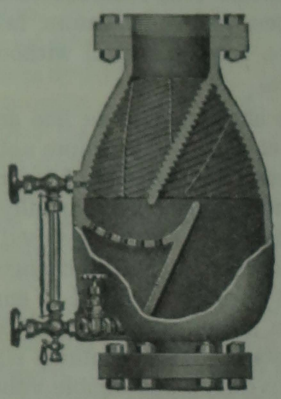


Fig. 3410

VERTICAL TYPE

IRON BODY

Perfect eliminating device for taking water out of live steam. When installed above the throttle of an engine with a good steam trap of ample size to fully drain the receiving chamber, it furnishes steam that is better than 99 per cent dry, and in some tests as high as 99.6 has been attained. The design of this machine, itself, proves the correctness of the principles upon which it is constructed. Its effectiveness in separating liquids or solids from steam currents passing through it, with either upward or downward flow, will be understood from a glance at the above illustration. The inner walls and baffle are fully corrugated, all lines of corrugation leading to one point, the receiver portion of the machine.

For general use in eliminating the entrained water from live steam, thereby furnishing dry steam for the engine, this type of separator may be relied upon to give entirely satisfactory results. May be used safely with engines having small clearance in the cylinder.

Size, Inches	Height, Inches	Diameter Flanges, Inches	Diameter of Body, Inches	Each
1½	11	Screw End	7	$30.00
2	11	Screw End	7	40.00
2½	13	7	8	45.00
3	15¼	7½	9	50.00
3½	16¾	8½	10	60.00
4	18	9	11	70.00
4½	20	9¼	12	75.00
5	22¼	10	13	80.00
6	25¼	11	15	110.00
7	28½	12½	17	125.00
8	31½	13½	19	160.00
10	37	16	23	225.00
12	40¾	19	25½	250.00

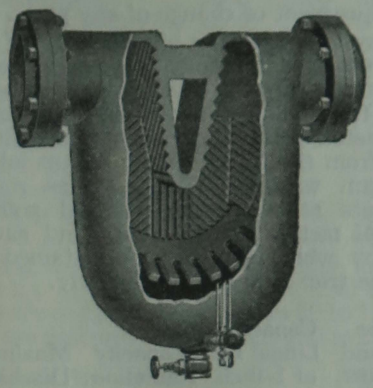


Fig. 3411

HORIZONTAL TYPE—IRON BODY

Design is known as an undershot construction. By this is meant that the steam, after being impinged against a baffle plate, passes around under the baffle plate to the outlet. The main feature contributing to the successful operation of this form of separator is that the baffle plate is not set at right angles to the entering steam current, but is set at an angle, so that when the steam is impinged against it the particles of water rebound at an opposite angle. This sets up a rotating motion in the steam, bringing the latter in contact with the inside walls of the separator. These walls are heavily corrugated, as is also the surface of the baffle plate, and all corrugations are designed so as to carry the drainage out of and away from the course of the steam.

The whirling or centrifugal motion imparted to the steam by means of the slanting baffle is of the utmost value, as the steam is literally whipped over the numerous corrugations. Any moisture not caught by the upper baffle plate and by the inner walls is finally separated by means of additional baffle plates located in the well or receiver portion of the separator, one of these plates being shown in the illustration.

Size, Inches	Height to Center of Inlet, Inches	Diameter Flanges, Inches	Distance Between Flanges, Inches	Each
1½	9	Screw End	9	$30.00
2	9	Screw End	9	40.00
2½	12	7	13¼	45.00
3	13	7½	15¼	50.00
3½	14	8½	16	60.00
4	15	9	18¼	70.00
4½	17	9¼	19¼	75.00
5	20¾	10	20¾	80.00
6	22	11	21¼	110.00
7	25	12½	27¼	125.00
8	29	13½	30¼	160.00
10	36	16	31	220.00
12	40	19	36	250.00
14	42	21	39	300.00

STEAM TRAPS

WRIGHT

EMERGENCY THREE-VALVE

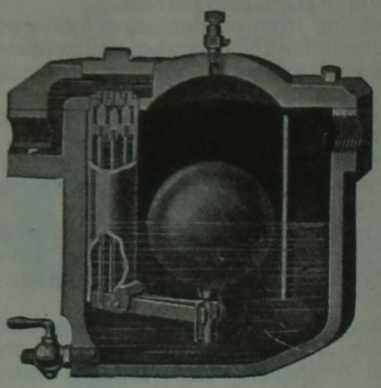


Fig. 3412

For pressures up to 200 pounds. The three valves are opened one at a time as needed, giving the trap enormous discharge capacity; automatic regulation to heavy or light service, almost entire freedom from the throttling effect and wear on the valves and seats, and adaptability to any working pressure up to 200 pounds, without adjustment or change of any parts.

Valves are located at the highest point of trap, entirely removed from accumulations of grit, scale, etc. Working parts are attached to the cover and are accessible without disturbing the piping. Valves and valve seats are made of Monel metal. Seats may be removed without removing the cover from the trap. Water seal at inlet and outlet makes steam waste impossible. Has round seamless copper floats reinforced at essential points by extra thickness of metal. Water gauge and gauge glass are provided by which it can be ascertained at a glance whether the trap is operating properly.

NOS.	Size In and Outlets, Inches	Capacity, Lineal Ft. of 1-Inch Pipes	Capacity Radiation, Sq. Ft.	Maximum Discharge, Per Hour	Weight Each, Lbs.
1	½	9,000	3,000	4,400	70
2	¾	11,000	3,700	5,600	100
3	1	13,800	4,600	7,000	120
4	1¼	23,400	7,800	10,400	140
5	1½	37,800	12,600	14,400	160
6	2	60,000	20,100	19,200	220
7	2½	87,000	29,000	32,000	260
8	3	126,000	42,000	45,500	320

CORLISS

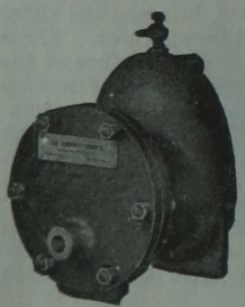


Fig. 3413

For vacuum service and pressures up to 300 lbs. Used on live and exhaust steam lines, evaporators, compressed air systems, high pressure gas mains, etc. Consist of hot six parts: cast iron body, valve, valve seat, float arm, float and cover. Cover is fitted into ground recess of body, eliminating the use of rubber packing. Valve mechanism and float are screwed to cover and are removable as one unit.

"Junior" trap is for pressures not over 125 pounds.

NOS.	Pipe Conn., Inches	Capacity Water Per Hour, Lbs.	Weight Each, Lbs.	Each
Junior	½	500	24	$15.00
0	½	1,000	45	20.00
1	¾	3,000	65	25.00
2	1	4,600	85	32.00
3	1¼	6,200	105	42.00
4	1½	9,000	130	55.00
5	2	12,000	175	75.00
6	2½	15,000	215	90.00
7	3	20,000	300	130.00
8	3½	25,000	350	165.00
9	4	35,000	400	220.00
10	5	50,000	430	280.00

STEAM TRAPS

SQUIRES—GENUINE

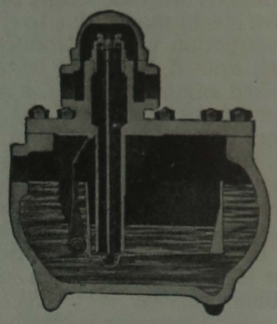


Fig. 3414

IMPROVED

The Squires Steam Trap removes water of condensation from steam pipes, steam separators, heaters, coils, stills, engine cylinders, receivers, etc., without allowing steam to escape.

All joints are above the water line and exposed to the temperature of steam only, therefore not encountering the corrosion or unequal expansion and contraction incident to the varied temperature of a partially submerged joint. Every joint is machined and jigs are used in manufacturing the traps, making all parts interchangeable. The hinge of the cast iron bucket is tapered to engage open bronze bearings, and in no instance can any corrosion or solids affect the operation. Trap contains no floats, levers or joints to fill with dirt. The double valve mechanism has a large discharge valve and is especially adapted for heavy condensation problems.

STANDARD VALVE

NOS.	Pipe Connection, Inches	Capacity: 1-Inch Pipe Linear Feet	Capacity: Square Feet of Radiation	Capacity: Lbs. Water, Per Hour	Weight, Each Lbs.	Each
⅜	⅜	3,000	1,040	400	35	$14.00
A	½	4,350	1,505	800	53	20.00
B	¾	6,300	2,180	1,300	60	22.00
C	1	9,300	3,220	2,100	74	28.00
D	1¼	16,500	5,710	2,900	102	35.00
E	1½	28,200	9,755	4,200	154	50.00
F	2	40,800	14,115	6,500	225	70.00
G	2½	98,100	33,945	12,500	279	100.00
H	3½	271,750	94,025	28,000	755	200.00

DOUBLE VALVE

NOS.	Pipe Connection, Inches	Capacity Pounds Water, Per Hour	Weight Each, Pounds	Each
A	½	1,200	53	$24.00
B	¾	1,800	60	27.00
C	1	2,800	74	34.00
D	1¼	3,800	102	42.00
E	1½	5,600	154	60.00
F	2	10,000	225	84.00
G	2½	18,000	279	120.00

Capacity based on pressures above 100 lbs.

Note.—Extra for vacuum attachment for all size traps, each $2.00.

STEAM TRAPS

MODEL D

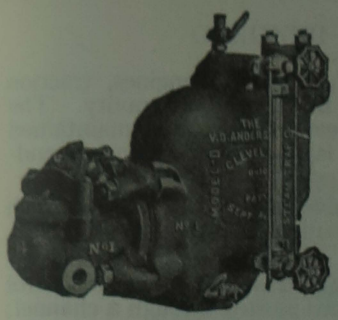


Fig. 3415

Operates continuously and automatically. Valve and seat always sealed with at least three inches of water, eliminating possibility of live steam escaping with condensation. Operates at pressures varying from 250 Lbs. to gravity. Can easily be changed to accommodate varying pressures. All parts machined to solid gauges and are interchangeable. Gauge glass always indicates whether or not trap is working properly. Each trap tested and inspected under hydrostatic as well as steam boiler pressure.

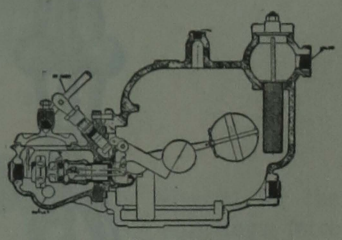


Fig. 3416

Gaskets used are set into counterbored recesses and all bolt strains are brought to bear directly over the packing joints which eliminates any possibility of blowing out. The drain or discharge line should be connected to the side of the trap head which will be most convenient. Place a union nearest the head and plug the other side. When the trap is working properly, the gauge glass will show from three inches to about half full of water, depending on conditions. If the valve becomes obstructed, the water will begin to disappear from the glass.

NOS.	1	2	3
Height O. A., Inches	15½	16⅛	18
Length O. A., Inches	19¼	20⅜	24¼
Size Pipe Conn., Inches	½	¾	1
Maximum Disch. Cond. Per Hour, Lbs.	1500	2400	4000
Cap. Drainage, Square Feet	4500	7200	12,000
Cap. Drainage Line Feet, 1 Inch Pipe	13,500	21,600	36,000
Net Weight Each, Lbs.	81	92	150
Shipping Weight Each, Lbs.	110	114	195
Each	**$26.50**	**28.50**	**36.00**

NOS.	4	5	6	7
Weight O. A., Inches	18¾	22	23¾	27⅝
Length O. A., Inches	25¾	30⅜	32½	39
Size Pipe Conn., Inches	1¼	1½	2	2½
Maximum Disch. Cond. Per Hour, Lbs	5600	8000	12,000	24,000
Cap. Drainage, Sq. Feet	16,800	24,000	36,000	72,000
Cap. Drainage Line Feet, 1 Inch Pipe	50,400	72,000	108,000	216,000
Net Weight Each, Lbs.	166	268	321	525
Ship. Weight Each, Lbs.	211	335	394	640
Each	**$43.00**	**60.00**	**82.00**	**132.00**

To determine height to which condensation can be delivered, deduct five pounds from steam pressure at trap and multiply by two. Result will be equal to number of feet in height, trap will deliver exhaust water.

STEAM TRAPS

VESUVIUS

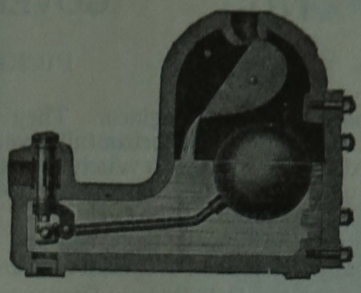


Fig. 3417

Regrinding ball valve is used which has a positive intermittent discharge and to which is imparted a positive rotating motion. This feature eliminates the usual trap troubles due to scoring of the valve surfaces, for the valve is either wide open or shut tightly. A slight rotative motion given the ball, tends to make a new seating surface at each discharge, uniformly distributing the wear.

The trap is freed from the collected condensation in minimum time, with a consequent reduction of scoring effect on valve.

NOS.	0	1	2	3
Cap. Sq. Ft. of Surface	1600	2400	3100	4300
Cap. Lineal Ft. of 1 Inch Pipe	4800	7200	9300	12900
Discharge in Lbs. per Hour	560	830	1080	1520
Size, Pipe Conn., Inches	¾	1	1¼	1½
Length, Inches	16	17	19	23
Width, Inches	8	9	11	12
Height O. A., Inches	13	14	15	17
Height Outlet, Inches	5	5	6	6
Weight Lbs. Class L and M	64	93	116	145
Weight Lbs. Class H	82	112	145	177
Each	**$28.00**	**35.00**	**42.00**	**50.00**

The following should be noted carefully in ordering: Class L traps are designed for pressures 1 to 50 pounds. Class M traps are designed for pressures 50 to 150 pounds. Class H traps are designed for pressures 150 to 250 pounds.

NASON—CLASS B

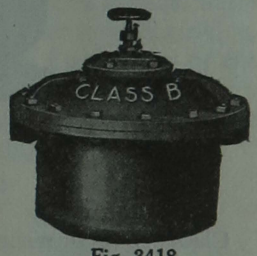


Fig. 3418

Designed for low pressure conditions usually found in steam heating plants.

Receive and automatically discharge the condensation from heating surfaces of every description without loss of pressure or waste of steam.

Traps have but one working part, so located as to insure immunity from injury through lodgment of scale or foreign particles. Permanent water seal always remains over the point of discharge, preventing the escape or loss of live steam when the valve is open. Operation is intermittent, thus definitely prolonging the integrity of the seating surfaces and reducing the danger of leakage at this point to a minimum. For pressures between 1 and 20 pounds.

NOS.	1	2	3	4	5
Pipe Conn., Inches	½	¾	1	1¼	1½
Discharge per Min. Lbs.	4½	6½	10	15½	23
Weight Each, Lbs.	40	80	113	176	336
Each	**$16.00**	**20.00**	**27.50**	**42.50**	**70.00**

CLASS C

Construction is identical with Class B but for pressures from 20 to 70 pounds.

NOS.	1	2	3	4	5
Pipe Conn., Inches	½	¾	1	1¼	1½
Discharge per Min. Lbs.	4½	6½	10	15½	23
Weight Each, Lbs.	40	80	176	113	336
Each	**$16.00**	**20.00**	**27.50**	**42.50**	**70.00**

SIDELUG

Similar to class B but with reinforcing lugs cast over the inlet and outlet, where the steam ports pass from pot to cover, so that leakage at or near these points cannot occur through the blowing out of the flange gasket. For pressures between 40 and 150 pounds.

NOS.	1	2	3	4	5
Pipe Conn., Inches	½	¾	1	1¼	1½
Discharge per Min. Lbs.	4½	6½	10	15½	23
Weight Each, Lbs.	47	92	125	212	343
Each	**$16.85**	**21.30**	**29.25**	**45.50**	**74.75**

GOVERNORS

PICKERING

For regulating the speed of steam engines. They are suitable for all types of stationary engines, traction engines, etc. Can be used in any position horizontally, vertically or inverted as they do not depend on gravity. The centrifugal action is opposed by the springs to which the balls are attached. A constant even speed can be maintained even where the load is continually changing. There are no jointed parts, so that the action is always smooth and dependable for quick action and close regulation of the engine.

Made of the best materials throughout; balls, cap and edges of flanges are turned; valve chambers of sizes one inch and larger are fitted with composition seats of special mixture and all valves are made of this metal, which is very durable.

On sizes ¾ inch and larger the Ball Ranger Device is provided, by means of which a wide range of engine speed adjustment can be obtained without changing the pulleys and belts; an extension can be put on this device to allow control from the cab of a traction engine; the balls used in this device are made of tool steel and are pushed through a channel; the adjustment of the valve secured in this manner cannot be disturbed by vibration or wear; a speeder spring and a Sawyer's lever are also provided; by means of the Sawyer's lever it is possible to stop the engine quickly from any point by a connecting cord or wire; in sawmill duty this feature is very important. All parts of these governors are interchangeable and can be renewed at any time at slight cost.

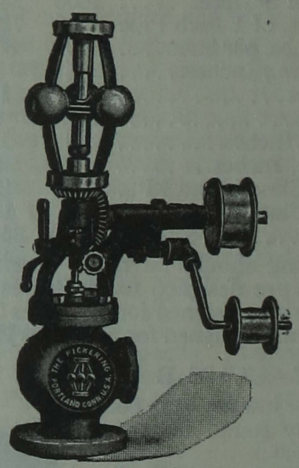


Fig. 3419

CLASS "A"

Class "A" is furnished with a safety stop device to stop the engine in case the governor belt breaks or comes off the pulley. The attachment consists of an idler pulley, which is dropped if the belt comes off the governor pulley and shuts off the steam to the engine.

Size, Inches	Height, Inches	Speed Governor Shaft, R. M. P.	Weight Each, Lbs.	Each
½	15½	550	18	$16.50
¾	14¾	600	22	18.50
1	19	350	38	21.00
1¼	20¼	350	45	24.50
1½	24	380	68	29.50
2	25⅛	380	73	36.00
2¼	27¼	300	95	42.00
2½	27¾	300	110	48.00
3	32¼	340	155	59.00
3½	34	340	175	71.00
4	41⅛	320	250	83.00
4½	41⅛	320	260	96.00
5	46½	275	400	109.00
6	49⅛	275	435	140.00
7	49⅜	275	510	170.00
8	54	260	700	210.00
9	59	260	745	241.00
10	61	225	860	270.00

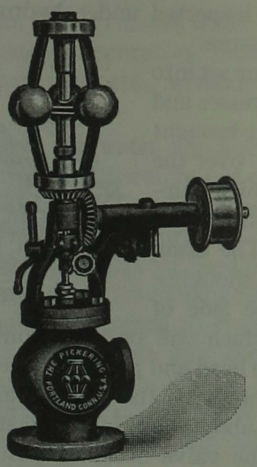


Fig. 3420

CLASS "B"

Class "B" is the same as Class "A" but has not the safety automatic stop. The parts may be purchased separately to convert this governor into Class "A" at any time.

Size, Inches	Height, Inches	Speed Governor Shaft, R. M. P.	Weight Each, Lbs.	Each
½	15½	550	17	$14.00
¾	14¾	602	20	16.00
1	19	350	35	18.00
1¼	20¼	350	42	21.00
1½	24	380	65	25.00
2	25⅛	380	70	30.00
2¼	27¼	300	90	35.00
2½	27¾	300	105	40.00
3	32¼	340	150	50.00
3½	34	340	170	60.00
4	41⅛	320	245	71.00
4½	41⅛	320	255	83.00
5	46½	275	390	94.00
6	49⅛	275	525	122.00
7	49⅜	275	500	150.00
8	54	260	690	185.00
9	59	260	730	215.00
10	61	225	850	240.00

GOVERNORS

GARDNER—CLASS A

STANDARD TYPE

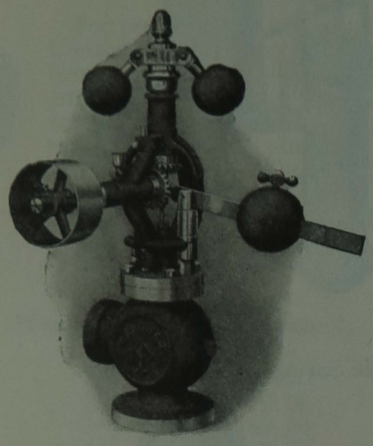


Fig. 3421

Gravity action governor, especially adapted for the larger types of stationary engines. The centrifugal force of the balls is opposed by the resistance of a weighted lever, and the speed is varied by the position of the weight on the lever. Automatic safety stop is simple and absolutely reliable. The action is accomplished by permitting a slight oscillation of the shaft bearing, which is supported between centers and held in position by the pull of the belt; a projection at the lower part of the shaft bearing supports the fulcrum of the speed lever. If the belt breaks or slips off the pulley, the support of the fulcrum is forced back, allowing the fulcrum to drop, instantly closing the valve. It never fails to work at the proper time.

The valve chamber is fitted with valve seats of a special composition. Valve is of the same material and is not affected by steam as this composition effectually resists the cutting action of live steam.

Governors are made for both horizontal and vertical engines, but unless otherwise specified are always sent for horizontal engines.

Size, Inches	Height, Inches	Speed Governor Shaft, R. M. P.	Shipping Weight Each, Lbs.	Plain Each
1¼	22½	250	60	$24.50
1½	22½	250	65	29.50
2	27	200	100	36.00
2¼	27⅝	200	116	42.00
2½	28½	200	130	48.00
3	31⅞	170	170	59.00
3½	32½	170	180	71.00
4	37	160	260	83.00
4½	37½	160	270	96.00
5	45½	150	445	109.00
6	45⅝	150	500	140.00
7	51¼	130	680	170.00
8	53	130	790	210.00
9	55	115	900	241.00
10	63		1275	270.00

GOVERNORS

GARDNER—CLASS A

SPRING TYPE

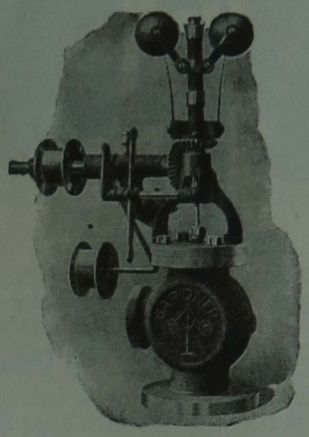


Fig. 3422

Recommended for traction and high-speed stationary engines. It is very quick and sensitive in action, and is therefore capable of responding promptly to the various changes of load. The balls are rigidly connected to steel springs, the lower ends of the springs being secured to a revolving sleeve which receives its rotation through mitre gears; links connect the balls to an upper revolving sleeve, which is free to move as actuated by the position of the balls. No gravity is employed. Furnished with automatic safety stop, which closes the valve instantly if the governor belt breaks or comes off the pulley.

Size, Inches	Height, Inches	Speed Governor Shaft, R. M. P.	Weight Each, Lbs.	Each
½	12	600	19	$16.50
¾	13	600	20	18.50
1	13½	600	22	21.00
1¼	19¼	450	43	24.50
1½	22	400	55	29.50
2	23	400	75	36.00
2¼	24	400	80	42.00
2½	27	350	120	48.00
3	29	350	140	59.00
3½	30	350	150	71.00
4	35	275	230	83.00
4½	36	275	240	96.00
5	37	275	300	109.00
6	42	280	420	140.00
7	44	280	500	170.00

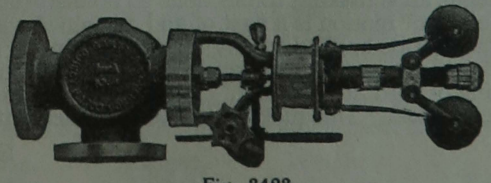


Fig. 3423

HORIZONTAL TYPE

Takes same list as vertical type. Not made with the automatic safety stop, but is furnished with the speeder and hand lever. Intended for use on engines where head room is limited.

INDICATORS

AMERICAN THOMPSON—IMPROVED

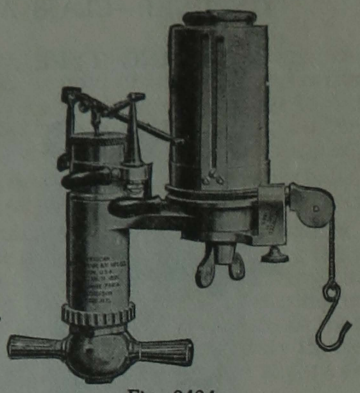


Fig. 3424

NO. 482

Inside Spring Indicator with Detent Motion

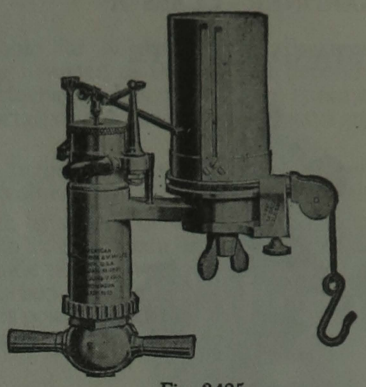


Fig. 3425

NO. 481

Inside Spring Indicator, Plain

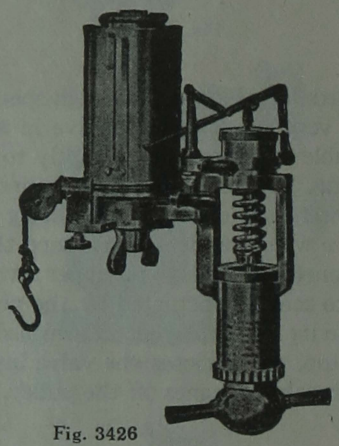


Fig. 3426

NO. 478

Exposed Spring Indicator with Detent Motion

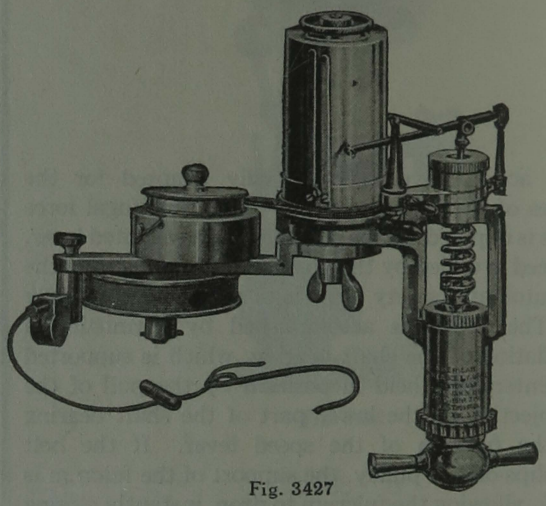


Fig. 3427

NO. 479

Exposed Spring Indicator with Detent Motion and Ideal Reducing Wheel

The paper cylinder movement is so constructed that the tension of the coiled drum spring within the paper cylinder can be increased for different speeds of engines. The spring can be taken up or let out as desired, thereby providing for fine adjustments, and it is not necessary, as in other instruments, to take up a whole coil or none.

For high-speed work no special adjustments are necessary with instrument, except to give sufficient tension to drum spring to keep cord taut at all points.

Whenever exceptionally accurate work is desired, the length of the diagram can be carefully measured and compared with the length of a line traced on the paper when the engine is working slowly. If the diagram is found to differ in length with this line, vary the tension of the spring until they agree.

The leading pulley consists of a wheel which leads the cord through a hole to the scored wheel, over which the cord can be run any possible angle to connect with the motion, wherever it may be. The pulley works in a sleeve which rotates in the bottom plate according to the adjustments required, and is held in its position and adjusted by a thumbscrew working in a groove on the sleeve which acts as a binding screw. In this manner it is held in any desired position and is free to revolve the moment the binding screw is loosened.

In high-speed, short stroke, electric light engines, great range of adjustment is generally necessary, as considerable trouble is often experienced on engines running three hundred revolutions per minute in arranging the cord so as to use independent arcs, making connections so no distortion of diagrams shall be given.

The detent motion is a part of and contained within the drum and base of the indicator. It is not a separate attachment that can be applied to any instrument and it can only be furnished with this improved indicator.

By its use several cards can be taken in the time ordinarily required for one, and with no slack or broken cord or unhooking of cord at any time. While of great value on slow-speed engine indicating, it will show its greatest value on high-speed work. This motion can be furnished with all sizes and styles.

EXTRA PARTS

	Each		Each
Steam Engine Indicator—any type	$80.00	Cylinder for either type	$5.00
Gas Engine Indicator—any type	80.00	Cards—Common (1½ or 2 inches) per M	3.50
Ammonia Indicator—any type	110.00	Cards—Metallic (1½ or 2 inches) per M	6.75
New Improved Detent Motion on any type	22.00	Cord Adjusting Plate	.25
Electrical Attachment—per instrument	35.00	Cord Indicator, per hank 21 Feet	.50
Reducing Wheel with bushings 18-72 inches	16.50	Cord, Reducing Wheel, per hank 8 Feet	.25
Reducing Wheel Bushings (only) 10-16 inches	2.25	Metallic Points, each	.10

(Two-inch Drum Right Hand Indicator always furnished unless otherwise specified.)

WATER RELIEF VALVES

ALL BRONZE

STANDARD TYPE

Fig. 3428

For pressures not exceeding 250 pounds. Used on tanks, pipe lines, etc. Can be furnished with female connection to order and with hand wheel for adjusting pressure at the regular list. Can also be furnished with British standard pipe threads at same price. When ordering, state pressure at which valves are to be set to relieve.

Size, Inches	Weight Each, Lbs.	Semi-Finished, Each	Finished, Each
½	1¾	$10.00	$11.00
¾	1¾	10.00	11.00
1	2½	12.00	13.00
1¼	4¼	15.00	16.00
1½	5½	18.00	19.00
2	8	27.00	29.00
2½	14½	43.00	46.00
3	18½	72.00	77.00
3½	31	95.00	105.00
4	49	120.00	135.00

CYLINDER TYPE—SIDE OUTLET

Female Connection

Fig. 3429

For pressure not exceeding 200 pounds. Designed for use on cylinders of steam engines to prevent blowout of cylinder heads by accumulation of water in the cylinders. Can be furnished with either or both connections, flanged at slight additional cost. British standard pipe thread furnished at regular list price. When ordering, state pressure at which valves are to be set to relieve.

Size, Inches	Weight Each, Lbs.	Semi-Finished, Each	Semi-Finished Nickel Plated, Each	Finished, Each	Finished Nickel Plated, Each
½	1¼	$10.00	$11.00	$11.00	$12.00
¾	1¼	10.00	11.00	11.00	12.00
1	2¼	12.00	13.00	13.00	14.00
1¼	4	15.00	17.00	16.00	18.00
1½	5½	18.00	21.00	19.00	22.00
2	7¾	27.00	30.00	29.00	32.00
2½	14¼	43.00	47.00	46.00	50.00
3	18½	72.00	80.00	77.00	85.00
3½	30	95.00	105.00	105.00	115.00
4	47	120.00	135.00	135.00	150.00

CYLINDER TYPE—TOP OUTLET

Male Connection

Fig. 3430

Size, Inches	Wgt. Each, Lbs.	Semi-Finished, Each	Semi-Finished Nickel Plated, Each	Finished, Each	Finished Nickel Plated, Each
½	1	$8.00	$9.00	$9.00	$10.00
¾	1	8.00	9.00	9.00	10.00
1	2	10.00	11.00	11.00	12.00
1¼	3½	12.00	14.00	13.00	15.00
1½	5	15.00	18.00	16.00	19.00
2	7¼	23.00	26.00	24.00	27.00
2½	12	38.00	42.00	40.00	44.00
3	15	65.00	73.00	68.00	76.00

WATER RELIEF VALVES

Fig. 3431

Fig. 3432

ALL BRONZE

Especially designed to have extra large relieving capacity, thus making it particularly adapted for service in connection with small pumps, water systems, tanks, etc.

Furnished with regulating wheel to increase or decrease the opening pressure or without wheel—the compression screw being covered with cap—thus making it fool-proof. On this account the cap pattern valve is preferred by many as a precaution against change in adjustment by unauthorized persons.

Valves can be furnished with either or both connections flanged at slight additional expense. For pressures not exceeding 250 pounds.

Size, Inches	Weight Each, Lbs.	Semi-Finished, Each	Semi-Finished Nickel Plated, Each	Finished, Each	Finished Nickel Plated, Each
½	1½	$10.00	$11.00	$11.00	$12.00
¾	1½	10.00	11.00	11.00	12.00
1	2½	12.00	13.00	13.00	14.00
1¼	4¼	15.00	17.00	16.00	18.00
1½	6½	18.00	21.00	19.00	22.00
2	10	27.00	30.00	29.00	32.00
2½	19½	43.00	47.00	46.00	50.00
3	26½	72.00	80.00	77.00	85.00
3½	39	95.00	105.00	105.00	115.00
4	50	120.00	135.00	135.00	150.00

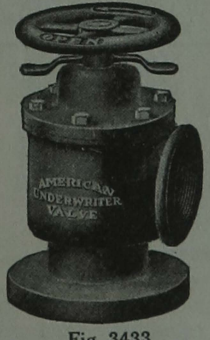


Fig. 3433

IRON BODY—UNDERWRITERS' BRONZE MOUNTED

Is accepted by the Inspection Department of the Associated Factory Mutual Fire Insurance Companies for use on Standard Underwriter Fire Pumps, the sizes required under this particular service being 3, 3½, 4 and 5 inches, and set at 100 pounds.

Approved Underwriter Relief Valves are always furnished as shown with flanged inlet, which conforms to Underwriters' requirements.

This same general construction can be furnished in all sizes listed below, and good for set pressures not exceeding 250 pounds.

They are universally used by the manufacturers of Underwriter Pumps and recognized by them as standard.

Hand wheel of ample size is provided to increase or decrease the opening pressure—conspicuously marked with an arrow to show direction for turning the wheel.

A wing locknut is furnished to prevent the compression screw from turning after proper adjustment has been made.

Size, Inches	Height, Inches	Weight Each, Lbs.	Each
2	10¾	30	$45.00
2½	12½	45	55 00
3	13¼	58	65.00
3½	15⅛	80	85.00
4	16	92	100.00
5	18⅞	170	150.00
6	21¾	240	225.00

WATER RELIEF VALVES

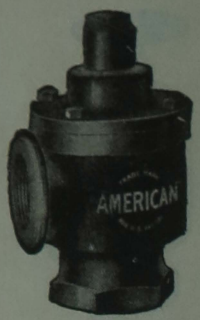


Fig. 3434

Fig. 3435

IRON BODY—BRONZE MOUNTED

Constructed with iron bodies and bronze mountings with high-grade steel springs, and are intended for use on pumps, tanks, pipe lines, etc., where requirements are not as severe as in fire protection service.

Valves have unusually large relieving capacity; and if desired, both connections on either style can be furnished flanged at slight additional cost.

Are regularly furnished set at any desired pressure not exceeding 200 pounds.

Size, Inches	Height, Inches	Weight Each, Lbs.	Each
2	10¾	30	$35.00
2½	12½	45	42.00
3	13¼	58	50.00
3½	15⅛	80	68.00
4	16	92	75.00
4½	17⅞	138	100.00
5	18⅞	170	120.00
6	21¾	240	170.00

HYDRAULIC RELIEF VALVES

ALL BRONZE

Fig. 3436

Valves are constructed for pressures from 500 to 5,000 pounds, and are made so that they can be taken apart to regrind without breaking the outlet connection. Special metal of great tensile strength is used. The springs are of special high-grade steel, the greatest care being taken in tempering them.

All threaded connections can be furnished British standard pipe thread at same price, if desired.

When ordering, state pressure at which valves are to be set to relieve.

Size, Inches	Capacity, Lbs. 301 to 800, Each	801 to 3000, Each	3001 to 5000, Each
½	$13.00	$17.50	$21.50
¾	13.00	17.50	21.50
1	16.00	21.50	28.00
1¼	21.00	28.00	39.00
1½	29.00	39.00	60.00
2	45.00	60.00	85.00

REGULATING VALVES

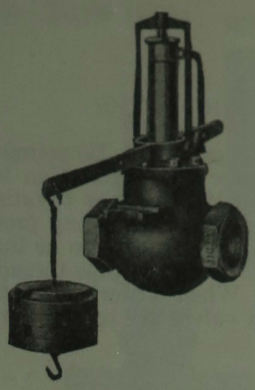


Fig. 3437

NO. 1

Will reduce any initial pressure of 200 pounds or less to any lower delivery pressure and automatically maintain it constant. Valves are constructed for the reduction of steam at any delivery pressure less than forty pounds. Regular type has no dash pot, and should be used where the delivery pressure is not subject to a pulsation. Sizes 1¼ inches and less, have bronze bodies, and all sizes over are made of iron. Sizes 1½ inches and less have screwed ends only; 2 to 6 inches have flanged or screwed ends; larger sizes have flanged ends only. Unless otherwise ordered, screwed end valves will be sent on sizes up to 6 inches.

Size, Inches	Height, Inches	Weight Each, Lbs.	Each
½	7¼	18	$20.00
¾	7¼	18	20.00
1	7½	18	22.00
1¼	8	18	24.00
1½	10½	30	25.00
2	13	55	30.00
2½	13½	65	35.00
3	14	80	40.00
3½	14¼	95	50.00
4	14½	95	60.00
4½	18½	150	70.00
5	18½	150	75.00
6	19½	185	100.00
7	20½	275	135.00
8	24½	400	175.00
10	26½	525	275.00
12	29	800	400.00
14	33	1100	500.00

NO. 2

Same as above regulator, but furnished with an oil dash pot which will prevent the lever from jumping when the delivery pressure is subject to a pulsation. The inner valve is required to operate frequently and the dash pot tends to steady its movement.

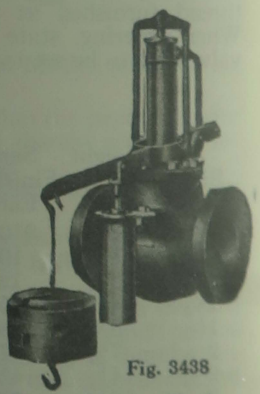


Fig. 3438

Size, Inches	Height, Inches	Wgt. Each, Lbs.	Each
½	7¼	18	$24.00
¾	7¼	18	24.00
1	7½	18	26.00
1¼	8	18	28.00
1½	10½	30	30.00
2	13	55	35.00
2½	13½	65	40.00
3	14	80	46.00
3½	14¼	95	56.00
4	14½	95	68.00
4½	18½	150	80.00
5	18½	150	85.00
6	19½	185	111.00
7	20½	275	146.00
8	24½	400	187.00
10	26½	525	288.00
12	29	800	414.00
14	33	1100	516.00

PRESSURE REGULATORS

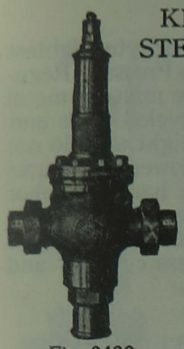


Fig. 3439

KEY-TYPE—ALL BRONZE
STEAM AND AIR PRESSURE

Intended for service in reducing steam, water and air pressures. Adapted for elevator pumps having steam supply pipe 2 inches or smaller. Entirely self-contained. Provided with a dash pot. Suitable for initial pressures up to 250 pounds. Will reduce to any lower pressure and automatically maintain it regardless of the demand or fluctuations in the high or initial pressure.

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
½	9	$20.00	1¼	19	$30.00
¾	9	20.00	1½	29	42.00
1	15	25.00	2	48	55.00

BALANCED VALVES

ALL BRONZE
WITH YOKE AND LEVER

To control pumps and engines by means of tank floats or cords to distant points, and in connection with various devices for controlling the flow to water wheels, receivers, open heaters and other similar devices. Self-closing by means of the weight. The length of the lever causes them to open slowly.

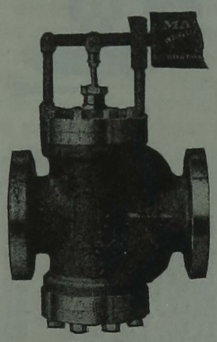


Fig. 3440

Size, Inches	Length Over Unions, Inches	Weight Each, Lbs.	Each
½	5½	6	$5.50
¾	6	7	6.50
1	6 5/16	9	8.00
1¼	7½	14	9.00
1½	8⅜	17	10.50

REGULATING VALVES

STEAM, AIR AND GAS

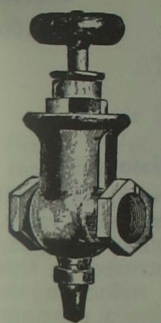


Fig. 3441

For universal application to all conditions under which reduced pressure of steam, air or gas is required. Compact and self-contained without levers, weights or projection. Has no drip or leak of steam or air.

Used on steam heating apparatus dryers, slashers, jacket kettles of all kinds, air and water pumps, etc.

Sizes up to 1¼ inch made of bronze; all sizes above 1¼ inch are of cast iron with bronze mountings. Screwed ends furnished up to 2½ inches. 3 and 4 inches are flanged.

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
½	7	$22.00	2	34	$44.00
¾	7	22.00	2½	47	57.00
1	7	22.00	3	98	72.00
1¼	8	28.00	4	154	100.00
1½	20	35.00			

REGULATING VALVES

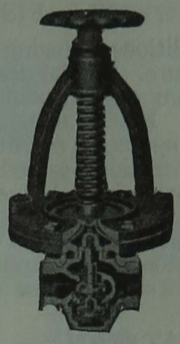


Fig. 3442

WATER PRESSURE

Every part of the Regulator which comes in contact with the water (except the diaphragm) is made of best composition. Rust or clogging with sediment is entirely avoided.

Will deliver water into service-pipes at any desired pressure, uniformly and permanently at the point at which it is set.

Screwed ends up to 2½ inches. Larger sizes flanged.

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
¾	18	$17.00	2½	34¾	$57.00
1	18	22.00	3	37	72.00
1¼	21½	28.00	4	110	100.00
1½	21½	35.00	5	175	135.00
2	27¾	44.00	6	200	180.00

REDUCING VALVES

ALL BRONZE

For pressure up to 300 pounds.

For reducing boiler pressure on steam heating systems of all types, where it is desirable to use a lower pressure than that on the boiler. Valve is provided with a dash pot, which prevents chattering or pounding. Made of a special bronze composition.

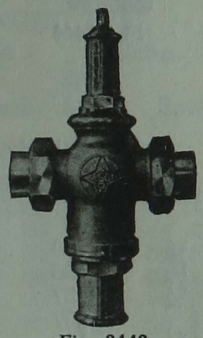


Fig. 3443

Size, Inches	Length Over All, Inches	Length Over Unions, Inches	Weight Each, Lbs.	Each
½	12¼	5¾	6	$18.00
¾	12¼	5¾	6	18.00
1	15	7	11	22.00
1¼	17	8	16	28.00
1½	19¼	9	23	35.00
2	21⅛	11¼	42	44.00

IRON BODY—FLANGED

Pressure up to 180 Pounds

For steam, water, air, gas, or oil. Responds quickly to the slightest variation or sudden draw on the service pressure. Reduces any initial pressure to any desired low pressure in one reduction. Will not chatter, stick nor allow pressure to build up.

Cast iron body; internal wearing parts of bronze. Dash pot cylinder on sizes 2½ to 4 inches of bronze, on sizes over 4 inches of cast iron with bronze lining secured in the center, leaving a space between the iron and composition for the unequal expansion of the metals.

Size, Inches	Diameter Flanges, Inches	Thickness Flanges, Inches	Weight Each, Lbs.	Each
2½	7½	⅞	70	$57.00
3	8¼	15/16	109	72.00
3½	9	1	162	85.00
4	10	1 1/16	188	100.00
5	11	1⅛	255	135.00
6	12½	1¼	395	180.00
8	15	1⅜	655	250.00
10	17½	1⅝	1400	350.00

REDUCING VALVES

FISHER

Are applicable to a wide range of conditions, reducing either steam, air, water, gas or oil; respond quickly to slightest variation or sudden draw on service pressure. Special design permits these types of Reducing Valves or Pressure Regulators to take controlling pressure from any desired point. All valve bodies are made of pig iron valve mixture metal except smaller sizes, which are of bronze. Inner valves are semi-balanced, double seated type with beveled seats and seat rings ground in and tested in actual operating conditions; function with a comparatively small weight and do not require dash pots as do types equipped with single-seated valves. Operate at all times on highest to lowest pressures without hammering or chattering and never stick. Valves and seat rings are cast from special formula, hard phosphor bronze, seat rings being set in valve ports with hydraulic pressure; valve stems are cut from tobin bronze rods. Regular and increased outlet types are of the diaphragm-actuated types, diaphragms of which are constructed with several layers of heavy fabric and pure rubber. In piston type, diaphragm is dispensed with and a hard drawn brass cylinder and special packed piston is used. All parts are standardized and can be readily duplicated.

REGULAR PATTERN

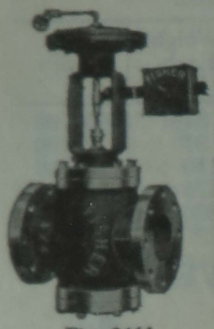


Fig. 3444

Particularly adapted to low pressure service; special type of construction permits equipping it with different sizes of diaphragms, making it suitable for various pressures. Is of diaphragm-actuated type, controlled by a lever and sliding weight which can be swiveled in any direction. Illustration shows inverted type, which is most universally used and is always supplied on orders unless otherwise specified.

SCREWED TYPE

Size, Inches	Angle Body, Wgt. Each, Lbs.	Each	Size, Inches	Globe Body, Wgt. Each, Lbs.	Each
			¼	25	$27.50
⅜	30	$25.00	⅜	30	27.50
½	36	25.00	½	36	27.50
¾	37	27.50	¾	37	28.50
1	107	30.00	1	107	32.50
1¼	110	35.00	1¼	110	37.50
1½	120	42.50	1½	120	45.00
2	129	50.00	2	129	52.50
2½	147	58.00	2½	147	60.00
3	160	70.00	3	160	72.50
3½	170	82.50	3½	170	85.00

STANDARD FLANGED TYPE

Size, Inches	Angle Body, Wgt. Each, Lbs.	Each	Size, Inches	Globe Body, Wgt. Each, Lbs.	Each
1	113	$35.00	1	113	$35.00
1¼	114	40.00	1¼	114	40.00
1½	125	45.00	1½	125	45.00
2	136	50.00	2	136	55.00
2½	158	60.00	2½	158	65.00
3	170	75.00	3	170	80.00
3½	190	87.50	3½	190	90.00
4	205	100.00	4	205	110.00
4½	223	112.50	4½	223	122.50
5	245	125.00	5	245	135.00
6	266	150.00	6	266	150.00
7	297	187.50	7	297	187.50
8	377	225.00	8	377	225.00
10	557	275.00	10	557	275.00
12	691	450.00	12	691	450.00
			14	1007	600.00
			16	1360	800.00

Note.—If valves are used for anything besides steam complete information on installation must be given on orders. Also maximum and minimum high and low pressures must be indicated.

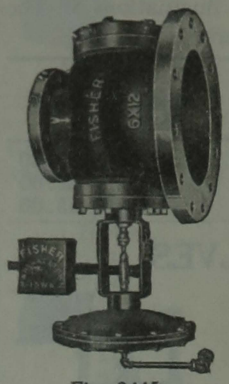


Fig. 3445

INCREASED OUTLET TYPE

Designed for low pressure service and vacuum systems of steam heating plants. Has an increased or expanded outlet, which allows for quick expansion of steam after passing through valve from high pressure side. Inner valve is practically balanced, enabling the reduction from high initial to atmospheric pressure or lower. Can be equipped with different sizes of diaphragms, making it suitable for any desired reduced pressure for various types of installations. Inverted and vertical types take same list.

Size, Inches	Screwed Type, Each	Flanged Type, Each
¼x⅜	$27.50	.....
⅜x½ or ¾	27.50	.....
½x¾ or 1	30.00	.....
¾x1, 1¼ or 1½	31.00	.....
1x1¼, 1½ or 2	32.50	$40.00
1¼x1½, 2 or 2½	37.50	45.00
1½x2, 2½ or 3	47.50	50.00
2x2½, 3, 3½ or 4	55.00	55.00
2½x3, 3½, 4, 4½ or 5	75.00	76.50
3x3½, 4, 4½, 5 or 6	80.00	85.00
3½x4, 4½, 5, 6 or 7	.....	100.00
4x4½, 5, 5½, 6, 7 or 8	.....	112.50
4½x5, 6, 7, 8 or 9	.....	126.00
5x6, 7, 8, 9 or 10	.....	140.00
6x8, 9, 10 or 12	.....	167.50

Size, Inches	Flanged Type, Each
7x8, 9, 10, 12 or 14	$206.00
8x9, 10, 12, 14 or 16	245.00
10x12	300.00
10x14	320.00
10x16	350.00
10x18	375.00
10x20	400.00
12x14	460.00
12x16	485.00
12x18	510.00
12x20	540.00
12x22	565.00
12x24	600.00

PISTON TYPE

High Pressure Reducing or Regulator

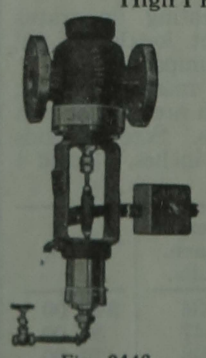


Fig. 3446

For high pressure work, taking 50 to 400 pounds on reduced side of valve. General construction similar to regular No. 10 A pattern illustrated on this page. Gives sensitive reduction on steam, water or air, giving a constant reduced pressure and maintaining it up to capacity of pipe regardless of quantity passing through valve; can be varied fifty pounds or more either way from the fixed point at which it is set. Furnished also Vertical in addition to inverted type, illustrated, which is desirable when pipe line runs near ceiling. Made in same sizes and weights and takes same list prices as regular inverted type No. 10A.

PUMP GOVERNORS

FISHER—PISTON TYPE

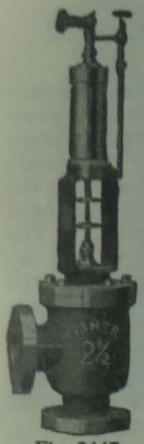


Fig. 3447

Automatically controls pumps working under pressure; maintains a uniform discharge pressure regardless of any variations in initial pressure. Used on steam turbines, Underwriters' fire pumps, hydraulic elevators, air compressors, or any service where a pump must work against pressure. Simplicity of construction assures ease of operation, automatic control, protection for pump, pipe, fittings, mains and hose; consumes only the minimum amount of steam necessary to maintain pressure. Adjustment is made by two small wheels, one being the adjuster, other serving as lock nut; equally easy to adjust governor when set at 400 or 500 pounds as at 10 or 15 pounds, as tension of spring or pump load need not be overcome. Use of dashpot, levers and weights is avoided. Pressure regulating cylinder is a hard drawn brass tube, the inside of which has a gunbarrel finish, insuring a smooth working surface for the piston. When worn from grit in water or from chemical action, it can be reversed. Use of another perfect cylinder is thus obtained without extra cost. Flanged valve bodies are cast with either standard or extra heavy flanges. Inner valves are of semi-balanced, double seated type, accurately machined so as to fit perfectly into beveled seat rings, which are pressed into valve ports under heavy hydraulic pressure. Valves and seat rings are cast from special formula, hard phosphor bronze; piston rods and valve stems are rolled from tobin bronze. All cast iron parts are made from best grade of pig iron valve metal mixture. Regular brass pipe work furnished consists of a special tee with globe valve and by-pass or blow-off pipe, as required by board of Underwriters. Capacity is five to 500 pounds. Discharge pressure depending on size of spring and cylinder used. Angle and Globe patterns can be had in sizes from ¼ to 12 inches. All parts are standardized and can be readily duplicated.

SCREWED TYPE

Angle or Globe Patterns

Size, Inch	Wgt. Each, Lbs.	Each	Size, Inch	Wgt. Each, Lbs.	Each
⅜	16	$25.00	1¼	40	$35.00
½	17	25.00	1½	58	42.50
¾	18	27.50	2	60	50.00
1	35	30.00	2½	85	58.00

STANDARD FLANGED TYPE

	Angle Pattern			Globe Pattern	
Size, Inch	Wgt. Each, Lbs.	Each	Size, Inch	Wgt. Each, Lbs.	Each
1	40	$35.00	1	42	$37.50
1¼	43	40.00	1¼	45	42.50
1½	62	45.00	1½	64	47.50
2	65	50.00	2	67	52.50
2½	96	60.00	2½	100	63.00
3	105	75.00	3	110	78.50
3½	125	87.50	3½	132	90.00
4	130	100.00	4	137	105.00
4½	135	112.50	4½	142	117.50

Note.—When ordering specify liquid used other than water, maximum and minimum boiler and pump discharge pressures. Can be furnished special for 10,000 pound discharge pressures and with drawn steel tube cylinder for ammonia service pumps. For superheated steam service, steel bodies with monel metal or nickel steel trimmings can be furnished. Prices on Application.

PUMP GOVERNORS

FISHER—EXCESS PRESSURE TYPE

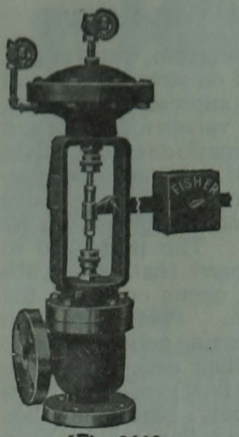


Fig. 3448

For Boiler Feed Pumps

For either the ordinary plunger or steam driven turbine type pumps where feed water is regulated by hand or automatically by water line regulator. Maintains a fixed or over pressure in feed line regardless of steam pressure variations; performs satisfactorily whether supplying one or a battery of boilers. Control is of the diaphragm-actuated type. By connecting steam pressure to under side and feed line pressure to upper side, pressure is equalized on diaphragm so that it has to withstand only the slight excess pressure necessary to overcome the weight and lever to close steam valve. Inner valves are of semi-balanced, double-seated type, cast from special formula, hard phosphor bronze; piston rods and valve stems are rolled from tobin bronze; diaphragms are constructed with several layers of fabric thoroughly impregnated and coated with pure rubber.

	SCREWED TYPE				FLANGED TYPE			
	Angle		Globe		Angle		Globe	
Size, In.	Wgt., Lbs.	Each	Wgt., Lbs.	Each	Wgt., Lbs.	Each	Wgt., Lbs.	Each
½	42	$25.00	45	$25.00	...	.....	...	.....
¾	44	27.50	46	27.50	...	.....	...	.....
1	84	30.00	86	30.00	90	$35.00	93	$37.50
1¼	91	35.00	94	35.00	95	40.00	98	42.50
1½	95	42.50	98	42.50	100	45.00	104	47.50
2	100	50.00	104	50.00	109	50.00	113	52.50
2½	117	58.00	123	58.00	126	60.00	130	63.00
3	137	70.00	143	78.00	140	75.00	145	78.50
3½	148	82.50	155	82.50	157	87.50	163	90.00

VACUUM TYPE

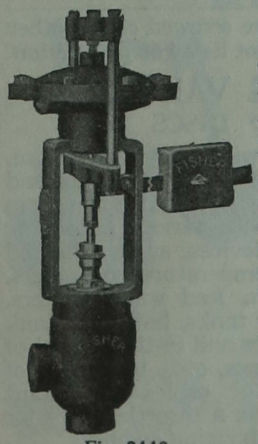


Fig. 3449

Used in connection with vacuum systems of heating, or wherever a certain number of inches of vacuum must be maintained. One adjustment; any desired amount from lowest to highest vacuum, of which pump is capable, can be secured by simply moving weight on lever. Speed of pump is controlled by piping vacuum from suction end of pump to under side of diaphragm. This forms a balance with lever and weight opening and closing steam valve, holding a steady vacuum. Balancing lever with weight can be swiveled in any desired direction.

Construction and operation are similar to No. 4 Governor, illustrated above.

	SCREWED TYPE				FLANGED TYPE			
	Angle		Globe		Angle		Globe	
Size, In.	Wgt., Lbs.	Each	Wgt., Lbs.	Each	Wgt., Lbs.	Each	Wgt., Lbs.	Each
½	41	$30.00	41	$30.50	...	.....	...	.....
¾	42	30.00	42	30.50	...	.....	...	.....
1	83	35.00	84	36.00	83	$40.00	85	$42.50
1¼	85	40.00	87	41.00	86	45.00	88	48.50
1½	97	47.50	100	48.50	105	50.00	107	53.00
2	107	55.00	110	56.00	109	55.00	110	58.50
2½	131	63.00	135	64.00	139	65.00	143	70.00
3	138	75.00	144	78.50	147	80.00	153	88.00

CHRONOMETER GOVERNOR VALVES

PLAIN OR YOKE TYPE

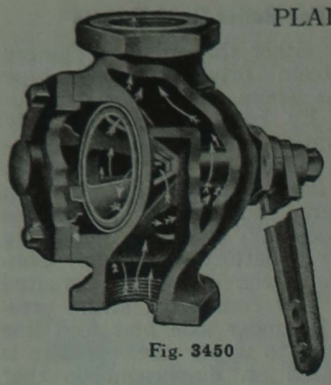


Fig. 3450

For steam, water or gas. Used on steam pump and air compressor governors, float valves for tanks and automatic devices. Valves are of rotating valve type, having a conical valve ground to a joint on its seat. The ports are so arranged that one-eighth turn opens or closes the valve. Ports close with a shearing action, protecting their edges and stopping flow gradually. Plain type is balanced by the pressure only. No stuffing box is required. Stops are arranged in a collar on hub. Yoke type has an outside yoke which with a setscrew, forms a bearing for end of stem. Varying degrees of sensibility may be obtained and the valve is perfectly balanced regardless of pressure conditions. Fitted with stuffing box. Used for close regulation and high pressure.

	Plain				With Yoke			
	Iron Body		Brass Body		Iron Body		Brass Body	
Size, Ins.	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each
3/8	.....	.....	.....	.....	.....	.....	4	$40.00
1/2	.....	.....	.....	.....	.....	.....	4	40.00
3/4	.....	.....	5	$30.00	.....	.....	7	50.00
1	7½	$40.00	7	50.00	.....	.....	9	60.00
1¼	9½	30.00	10½	60.00	10½	$60.00	12	80.00
1½	13¼	60.00	15	80.00	15	80.00	17	100.00
2	25	80.00	28	120.00	28	100.00	34	140.00
2½	40	100.00	45	150.00	45	140.00	40	180.00
3	55	150.00	73	220.00	67	180.00	56	260.00
4	160	.....	.....	.....	180	300.00	.....	.....
5	.....	.....	.....	.....	320	320.00	.....	.....
6	.....	.....	.....	.....	355	600.00	.....	.....

Sizes up to 3 inches included have screwed ends; other sizes flanged ends. **Price of sizes not listed on application.**

QUICK OPENING VALVES

WITH BALANCED DISCS

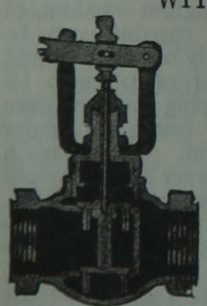


Fig. 3451

Valves are widely used with steam, air, gas, water and other fluids, and are especially adapted for use in connection with various automatic controlling devices, such as forced draft and temperature controllers, water motors, feed water heaters, condensation tanks, hot wells, tank feeding valves and in the control of pumps, engines, etc., by means of tank floats or cables to distant points, and as a throttle valve for donkey and hoisting engines.

Size, Inches	Center to Top of Stem, Inches	Brass Globe or Angle Type, Each	Iron Body Globe Type, Each
3/4	6¼	$5.50	.....
1	6¾	5.80	.....
1¼	7¼	7.50	.....
1½	7⅛	9.50	.....
2	8	14.00	.....
2½	9	18.50	.....
3	9⅞	30.50	.....
3½	11¼	53.50	$37.00
4	11½	70.00	47.00

*Angle sizes up to 2-incn inclusive.

AUTOMATIC STOP AND CHECK VALVES

FORD

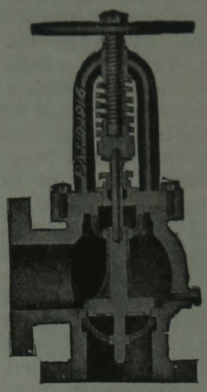


Fig. 3452

Flanged iron body, bronze mountings, globe or angle pattern; positively overcomes sticking and chattering. Sticking is commonly caused by the dash pot used in the ordinary type, but which has been eliminated in this valve. The chattering is further removed by having the valve unbalanced. Fitted with a piston choke-off under valve seat, so that by the time the steam is flowing from boiler into main in any appreciable quantity the valve disc is far enough from its seat to make wire drawing an impossibility. Made with travelling rod running through gland, so that operation of valve is visible. Has adjustment for slight differences of boiler and main pressures.

Size, Inches	Diam. Flanges, Inches	Face to Face, Inches (Globe)	Center To In and Outlets, Inches (Angle)	Weight Each, Lbs.	Each
2½	7½	10	5¼	90	$40.00
3	8¼	11¼	5½	125	50.00
4	10	13½	6¾	200	65.00
5	11	15	7¾	250	80.00
6	12½	17½	8¼	300	100.00
7	14	18½	10	400	125.00
8	15	19	11¾	500	155.00
10	17½	23	13	750	225.00
12	20½	25	15	1000	300.00

PUMP REGULATING VALVES

FORD

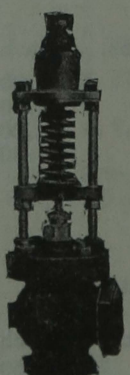


Fig. 3453

For steam pressures up to 250 pounds. Used on elevator, house, fire and boiler feed pumps and air compressors. A simple positive device free from unnecessary parts. It contains no diaphragms, being built on piston actuated construction. The steam valve is single seated and easy to reseat. The spring is so placed that it is kept comparatively cool at all times. Will act as a speed governor under normal discharge pipe conditions, the maximum pump speed being secured by adjustment of stop valve. Angle pattern furnished unless otherwise ordered. In ordering, state water pressure to be maintained, or if for open tank or for use with brine pumps.

Size, Inches	Height Center to Top, Inches	Center to Outlet, Inches	Weight Each, Lbs.	Flanged, Each	Screwed, Each
1	13	...	10	.....	$20.00
1½	16	...	20	.....	25.00
2	17	4¾	35	$34.00	30.00
2½	18	5¼	45	40.00	35.00
3	19	5¾	65	45.00	40.00
4	23	6¾	90	55.00	50.00
5	24	7⅝	250	95.00	85.00
6	26	8¾	300	135.00	125.00

REGULATING VALVES

SPRING-CONTROLLED DIAPHRAGM TYPE

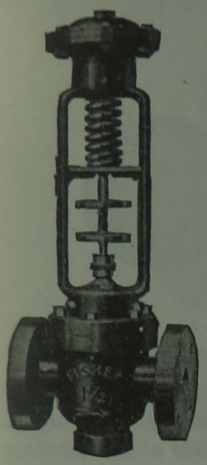


Fig. 3454

Combined diaphragm and spring-control regulating valve, with simple wheel adjustment. Long flexible spring and large area diaphragm make the semi-balanced inner valve sensitive to slightest variation in pressure. Used for steam driven pumps operating on closed systems, particularly the low pressure types; to control flow of fuel oil or gas to boilers, using boiler pressure as controlling factor, and as a pressure reducing valve. Sizes ⅜ to 1 inch, inclusive, have special phosphor bronze bodies; sizes 1¼ inches and larger have iron bodies; inner valves are cast from special formula phosphor bronze, while valve stems are cut from tobin bronze rods. Diaphragms are made with heavy layers of fabric and pure rubber, except when used for oil fuel service. Diaphragm housing ends are regularly tapped for ¼-inch pipe. All parts are standardized and can readily be duplicated.

SCREWED TYPE	STANDARD FLANGED TYPE		EX. HEAVY FLANG. TYPE	
Size, Ins.	Size, Ins.	Each Angle	Each Globe	Each Angle	Each Globe
⅜	1	$35.00	$37.50	$36.00	$38.50
½	1¼	40.00	42.50	41.50	43.50
¾	1½	45.00	47.50	46.00	48.50
1	2	50.00	52.50	52.00	54.50
1¼	2½	60.00	63.00	62.50	65.00
1½	3	75.00	78.50	78.00	81.50
2	3½	87.50	90.00	92.00	94.50
2½	4	100.00	105.00	105.00	110.00
3	4½	112.50	117.50	120.00	125.00
3½	5	125.00	130.00	135.00	140.00

TANK CONTROLLERS

FISHER

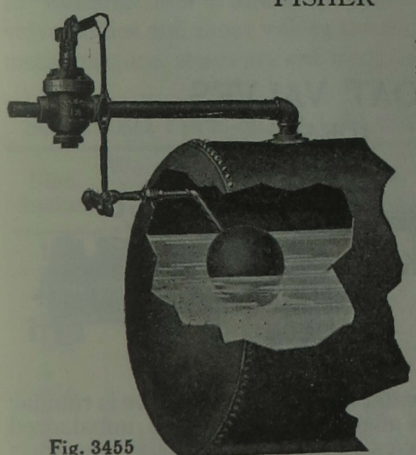


Fig. 3455

Device illustrated will control steam supply to pump according to accumulation of condensation in receiver tanks, or if pump is supplying tank it will control pump so as to maintain a certain level in tank. Can also be installed on waterline to control water level in tank or overflow where tank is discharging independently into sewer or line without pressure. Consists of regular balanced lever valve, steel connecting rods with turnbuckle, bell crank, stuffing box for tanks and seamless copper, low pressure float. Tank end of stuffing box has standard pipe thread. List is for complete device with either Globe or Angle pattern bodies, screw or flanged type, as specified.

Size Valve, Ins.	Size Float, Ins.	Each	Size Valve, Ins.	Size Float, Ins.	Each
½	7	$30.00	3	8	$55.00
¾	7	32.50	3½	8	60.00
1	7	35.00	4	10	70.00
1¼	7	37.50	4½	10	80.00
1½	7	40.00	5	10	90.00
2	8	45.00	6	10	100.00
2½	8	50.00	..	..	.....

BALANCED LEVER VALVES

FISHER

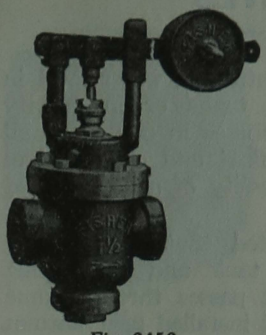


Fig. 3456

Designed to meet requirements of lever valve not effected by pressure but controlled by some outside force used in connection with lever. May be used to operate steam pump in connection with tank service, by placing valve in steam supply pipe and connecting its lever to a float in tank; used also with air, gas, water or other fluids; adapted for feed water heaters, tank feeding, quick opening valves, condensation tanks, hot wells or any place requiring a lever valve that closes off entirely when valve seats, yoke and lever can be swiveled in any direction. Arrangement is easily made whereby valve will open with either an upward or downward pull on lever. Valve bodies are cast from pig iron valve metal mixture; valves of phosphor bronze and stems of tobin bronze rods.

	SCREWED TYPE				FLANGED TYPE			
	Angle Pattern		Globe Pattern		Angle Pattern		Globe Pattern	
Size, Inch	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each	Wgt. Each, Lbs.	Each
½	10	$ 7.75	11	$7.75	..	.....	..	.....
¾	12	8.00	13	8.00	..	.....	..	.....
1	27	10.00	30	10.00	28	$10.00	31	$10.00
1¼	30	11.00	33	11.00	32	11.50	35	11.50
1½	37	12.00	40	12.00	39	12.00	43	12.00
2	49	14.00	53	14.00	56	14.25	60	14.50
2½	60	19.00	64	19.00	75	19.50	78	20.00
3	89	25.00	93	25.00	102	26.00	106	27.00
3½	97	31.00	110	31.00	122	33.00	126	35.00
4	..	.....	130	45.00	134	42.50	145	45.00
4½	..	.....	...	.....	155	51.25	168	55.00
5	..	.....	...	.....	184	60.00	199	65.00
6	..	.....	...	.....	229	70.00	246	80.00

Note.—Valves can be fitted with screw adjustment travel stop and with special length levers.

FLOAT VALVES

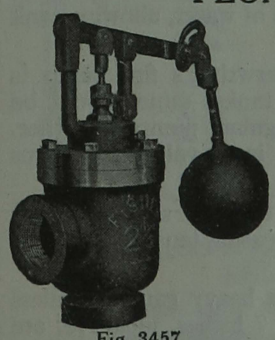


Fig. 3457

For Open Tank Service

Used in open tanks or reservoirs where a predetermined level of water or other fluid is to be maintained. Is an automatic valve, controlled by a seamless copper float directly connected to lever by an adjustable stem; suitable for cold water or air pressure ranging up to two hundred pounds. Construction the same as in balanced lever valves listed above.

SCREWED TYPE Angle and Globe Patterns			FLANGED TYPE Angle and Globe Patterns		
Size Valve, Ins.	Size Float, Ins.	Each	Size Valve, Ins.	Size Float, Ins.	Each
½	7	$11.75	3½	8	$38.00
¾	7	12.00	4	10	49.00
1	7	14.00	5	10	68.50
1¼	7	15.00	6	10	81.00
1½	7	16.00	8	10	128.50
2	8	18.00	10	12	140.00
2½	8	23.00	12	12	170.00
3	8	29.50	..	..	.....

Note.—Specify whether Angle or Globe patterns are desired. When used for anything besides steam, details of proposed usage and pressures to be used must be specified on orders. All parts for above valves are standardized and can be readily duplicated.

AUTOMATIC CHECK AND FLOAT TANK VALVES

FISHER

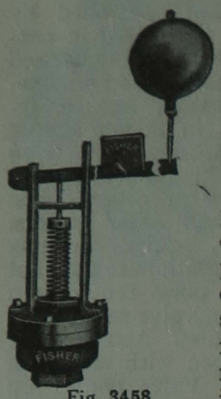


Fig. 3458

Used for controlling water level in open elevated tanks or in gravity systems. Combines in one valve all features of a float and check valve; eliminates necessity of a complicated installation.

So constructed that water being pumped into tank and that being drawn from it passes through same pipe. Valve is installed near bottom of tank, leaving about six inches for sediment chamber, thereby requiring no head-room above tank. Will maintain any desired level of water in tank, also permitting fire pressure to be carried on mains when tank is full.

When installed, weighted lever holds valve open, allowing water to enter through supply pipe connected to bottom of valve; as water enters valve chamber its velocity is lost, due to increased area of chamber; passing through it overflows into tank through round opening at top of valve body, which is also larger than supply pipe. By this construction, all violent water action is overcome, it being reduced to a steady bubbling flow that keeps valve seat clean.

Height of float above valve determines water level; when water engages float, it raises lever arm, which, being independent of valve stem, allows valve to gradually close, shutting off supply. In closing, valve noiselessly throttles itself, seating slowly with a perfect water cushion. This overcomes the water hammer. Closing with pressure, valve protects tank from overflow; should pressure in pipe line build up for any reason, increased pressure simply holds valve tight on its seat.

When an outlet is opened in system and discharge pressure from pump is not sufficient to supply the demand, valve opens instantly, due to head of water, allowing tank to assist in supplying demand.

If either regular tank or underwriter's fire pump is used for maintaining supply to tanks, same should be automatically controlled by regular pump governor. Bodies of checks are of cast iron; inner valves and stems of bronze.

Adjustment can be obtained through sliding weight on lever and by increasing or decreasing tension of bronze coil spring.

Each check is furnished with a heavy gauge seamless copper ball float. Sizes, 1½ to 7 inches, inclusive, are of the screwed type; 8-inch size and larger are flanged type.

TYPE NO. 15

Size, Inches	Each	Size, Inches	Each
1½	$25.00	5	$80.00
2	30.00	6	91.00
2½	35.00	7	105.00
3	42.50	8	120.00
3½	50.00	10	145.00
4	60.00	12	175.00
4½	70.00		

Note.—In ordering state whether for steam, cold or hot water, giving temperature; maximum and minimum pressure and, if closed tanks, give size of manhole.

BALANCED TANK VALVES

FORD

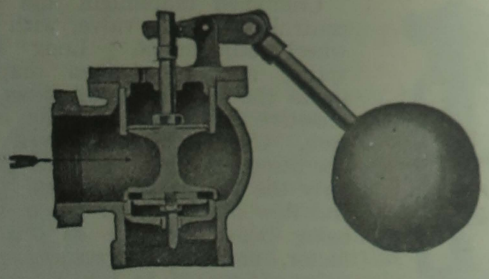


Fig. 3459

For Use on Pressure as High as 75 Lbs.

A reliable valve that will operate on high pressure with a small float to insure against overflowing. The float closes the valve simply against the friction of the moving parts, the pressure neutralizing itself upon the single seat, balanced construction. Valves are made of brass to 1½ inches, all sizes from 2 to 6 inches are of cast iron, screwed pattern with brass trimmings. All sizes have angle body unless otherwise specified.

Size, Inches	Height Center to Top, Inches	Weight, Lbs.	Each
1	5	2½	$10.00
1¼	5	3	12.00
1½	5	4	15.00
2	6	11	20.00
2½	6	15	25.00
3	7	25	35.00
4	10	80	50.00
5	11	120	80.00
6	12	190	110.00

Specify temperature and nature of liquid when ordering.

FLOAT VALVES

IDEAL

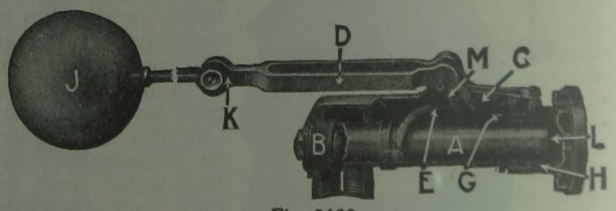


Fig. 3460

For regulating the water level in tanks. Valve is tubular and cannot get out of alignment; there is no unbalanced pressure; valve capacity is equal to full pipe size area; valve seats on a special insert in retaining plug and cannot become clogged or stopped up; seat can be removed without disconnecting valve; water level can be adjusted by changing angle of float lever.

Size, Inches	Length Body, Inches	Weight Each, Lbs.	Each
¾	....	....	$25.00
1	8 5/16	....	30.00
1¼	9 1/2	....	40.00
1½	10 3/4	....	50.00
2	12 1/16	....	60.00
2½	15 1/4	....	70.00
3	17 9/16	....	80.00
4	19 7/16	....	120.00

BACK PRESSURE VALVES

FISHER—NOISELESS TYPE

For Non-Condensing Service Only

Fig. 3461

Give satisfactory service where exhaust steam is utilized for heating, cooking, drying or any other purpose where a fixed amount of back pressure must be maintained; will automatically relieve to atmosphere any excess back pressure above the desired amount. Can be placed in any position in pipe line, it being necessary to change position of lever only, so that weight will hold inner valve closed. Constructed with an inner valve chamber with two accurately machined ports of different areas in which the semi-balanced, double piston type of valve functions, thus avoiding use of heavy counter weights and eliminating all tendency to pulsate and hammer. This inner valve is directly connected by two knuckle-jointed links to valve stem, which is supported at both ends, assuring perfect alignment at all times. Lever and weight control is positive, is easily adjusted to maintain any desired amount of back pressure up to fifteen pounds, also to hold valve open when no back pressure is desired. All parts are standardized and can be readily duplicated. Flanged type valves are drilled to Manufacturer's Standard unless otherwise ordered; valve bodies and inner valves are cast from pig iron valve metal mixture; stems are cut from cold rolled steel rods.

SCREWED TYPE NO. 9 FLANGED TYPE NO. 9F

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
1½	34	$14.00	1½	37	$15.00
2	36	14.00	2	40	15.00
2½	37	16.00	2½	41	17.00
3	43	18.00	3	47	19.00
3½	49	22.00	3½	52	23.50
4	62	25.00	4	66	27.00
4½	67	30.00	4½	74	34.00
5	90	40.00	5	97	44.00
6	142	60.00	6	147	65.00
7	162	80.00	7	170	86.00
8	205	100.00	8	214	106.00
9	245	120.00	9	255	127.00
10	280	145.00	10	291	153.00
12	370	220.00	12	385	229.00
			14	590	345.00
			15	780	400.00
			16	1005	465.00

Note.—All bodies are provided with an opening to which a drain pipe can be connected, also with special asbestos gaskets between body and cover. Valves can be furnished with beveled seats when so desired; prices upon application. Prices of extra heavy flanged type furnished upon application.

AUTOMATIC EXHAUST RELIEF VALVES

FISHER

For Condensing Service

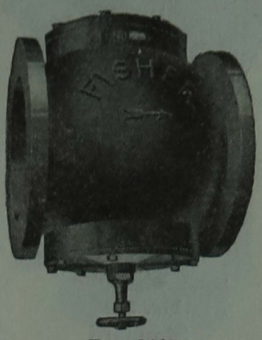


Fig. 3462

Necessary where a condensing engine or turbine is used. Can be placed in a branch. Taken from main exhaust line at most convenient point between engine or turbine and condenser. In operation it remains closed as long as vacuum is maintained in condenser, but opens instantly should vacuum be lost, protecting the apparatus by allowing engine to exhaust direct to atmosphere and run non-condensing, closing automatically when vacuum is restored. To prevent hammering and to insure noiseless operation, internal dash pots are provided in both horizontal and vertical types, the former having two and the latter one. Pots are of bronze and sufficiently large to furnish a cushion for valves. Inner valve is faced with special composition metal and seats on a bronze ring; will not stick or leak, due to provision being made for water seal. Positive acting inner valves function directly on valve stem and are adjusted by a convenient hand wheel located at bottom of horizontal types and at side of vertical types. Valve bodies are of pig iron valve metal mixture in flanged type only. Flanges are drilled to Manufacturer's Standard unless otherwise specified.

NO. 19 HORIZONTAL AND NO. 18 VERTICAL TYPES

Size, Inches	Width of Body, Face to Face, Inches	Diameter of Flanges, Inches	Weight Each, Lbs.	Each
6	12⅞	11	165	$100.00
7	15⅝	12½	207	150.00
8	16¼	13½	220	170.00
9	17⅜	15	335	225.00
10	17⅜	16	350	270.00
12	18½	19	440	335.00
14	21	21	500	415.00
15	22¾	22¼	900	460.00
16	22¾	23½	950	500.00
18	29	25	1275	584.00
20	29	27½	1800	670.00
22	32⅜	29½	....	917.00
24	32⅜	32	....	1170.00
30	42 5/16	38¾	....	2000.00
36	48	46	....	3000.00

COMBINATION BACK PRESSURE AND EXHAUST RELIEF VALVES

For Condensing and Non-Condensing Service

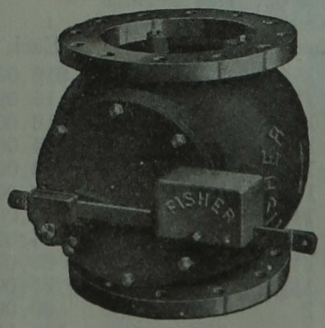


Fig. 3463

Used principally on vacuum heating systems and for installations requiring a valve suitable for either back pressure or automatic exhaust relief service or where a lever controlled relief valve is preferred. For non-condensing service, valve is weighted for a minimum back pressure of five pounds; for condensing service, valve is provided with water seal to prevent leakage under vacuum. Inner valves and dash pots are of bronze; bodies are of pig iron valve metal mixture, cast only with flanges. Sizes, dimensions and prices are same as Nos. 18 and 19 valves listed above.

EXHAUST HEADS

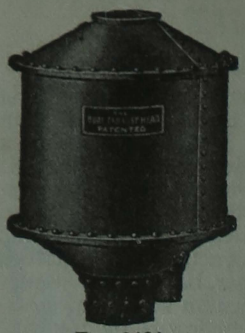


Fig. 3464
Burt

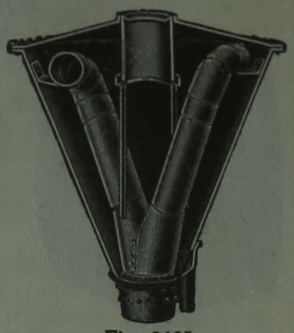


Fig. 3465
Standard

Open hearth galvanized iron; painted with anti-rust paint and equipped with malleable iron bases, galvanized drips; seams and attachments are watertight, head cannot overload or blow up if proper size is used. Have abundant room for expansion of steam. There is no back pressure. There is but one steam chamber, the entire head; no baffle plates, no diaphragm, no scrap metal.

Heads up to five inches in diameter have a very heavy metal base; over five inches they are fitted with extra heavy flanges.

For separating the water, oil from the exhaust steam.

In ordering, state inside diameter of exhaust pipe, horse power of engine, whether or not it is overloaded, and whether the exhaust is severe.

Size of Exhaust Pipe, Inches	Burt Exhaust Heads Hght., Inches	Diam., Inches	Size of Drip, Inches	Net Wgt., Lbs.	Ship Wgt., Lbs.	Each
1 or 1½	16	10	1	18	30	$12.00
2 or 2½	18	12	1	18	30	15.00
3 or 3½	20	14	1	35	50	18.00
4 or 4½	27	16	1	49	65	24.00
5	29	18	1¼	72	89	30.00
6	31	20	1¼	90	125	36.00
7	36	22	1¼	95	130	45.00
8	39	24	1½	125	152	54.00
9	43	26	2	160	210	63.00
10	46	30	2	182	222	75.00
11	46	30	2	182	222	80.00
12	48	32	2	270	435	90.00
13	51	34	2	305	470	105.00
14	56	36	2	385	550	120.00
15	59	39	2	500	659	145.00
16	62	42	2	559	799	160.00
17	69	45	4	610	840	170.00
18	76	48	4	700	950	190.00
19	79	50	4	785	1035	210.00
20	82	52	4	900	1150	225.00

STANDARD

Size of Exhaust Pipe, Inches	Burt Exhaust Heads Hght., Inches	Diam., Inches	Size of Drip, Inches	Net Wgt., Lbs.	Ship Wgt., Lbs.	Each
1 or 1½	21	16	1¼	27	33	$12.00
2 or 2½	27	21	1¼	27	33	15.00
3 or 3½	31	25	1¼	41	56	18.00
4 or 4½	37	30	1¼	62	77	24.00
5	40	32	1¼	70	90	30.00
6	43	35	1¼	102	125	36.00
7	47	39	1¼	127	157	45.00
8	50	42	1¼	190	228	54.00
9	53	45	1¼	225	265	63.00
10	57	49	1¼	245	290	75.00
12	64	55	2	345	375	90.00
13	67	58	2	375	405	105.00
14	71	62	2	400	490	120.00
15	74	65	2	460	545	145.00
16	77	69	2	525	620	160.00
18	85	76	2	600	720	190.00
20	95	82	2	800	975	210.00

DAMPER REGULATORS

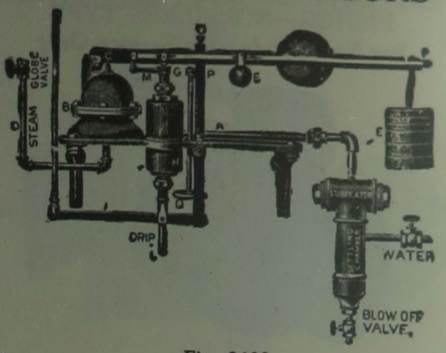


Fig. 3466

IMPROVED—AUTOMATIC

For the automatic regulation of pressure on steam systems. The weights are set at the desired pressure and the regulator automatically maintains this pressure by operation of the dampers. Made in three sizes: 3, 4 and 6-inch; the 6-inch being used where low pressure water is used and also for heavy dampers.

Prices on Application

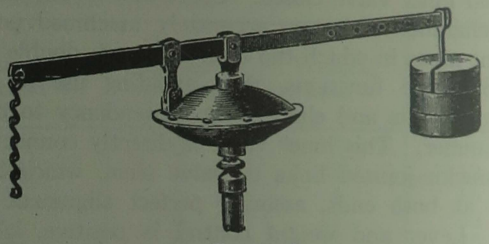


Fig. 3467

STANDARD PATTERN

For automatically controlling the check drafts on low pressure steam boilers employed in house heating.

Size, 7 Inches, Each $5.00

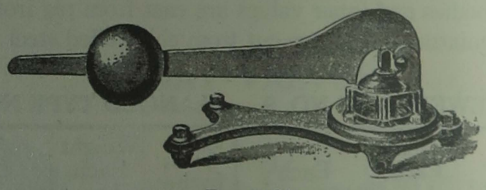


Fig. 3468

CLARK PATTERN

For low and high pressure steam boilers.

NOS.	For Boiler Capacity, H.P.	Each
1	Up to 5	$10.00
2	5 to 20	15.00
3	30 to 500	25.00

AUTOMATIC WATER FEEDERS

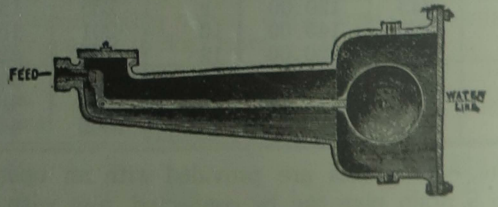


Fig. 3469

Automatically maintains proper water level in low pressure boilers. Boiler cannot run dry when this device is employed.

Each $20.00

POP SAFETY VALVES

PORTABLE

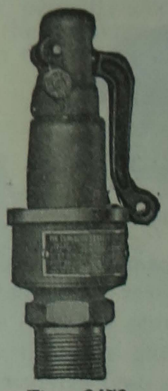


Fig. 3470
Top Outlet

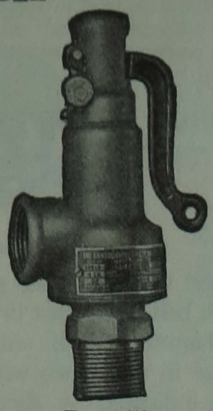


Fig. 3471
Side Outlet

Adapted for service on road rollers, tractors or similar equipment; the side outlet is convenient for piping discharge away.

Furnished for working pressures not exceeding 200 pounds; and, when so ordered, are made to meet any State Boiler Laws, A. S. M. E. Boiler Code or to comply with requirements of certain Canadian provinces.

Base, case, feather, adjusting ring, compression screw and caps, bronze composition; spring, made of crucible spring steel; spindle of steel; lever and spring washers, malleable iron.

Size, Inches	Height, Inches	Weight Each, Lbs.	Each
¾	5¾	1½	$8.00
1	6 5/16	2½	10.00
1¼	7 3/16	4	15.00
1½	8 9/16	6¼	20.00
2	10½	12¼	30.00
2½	11 15/16	17	40.00
3	13⅛	24	60.00

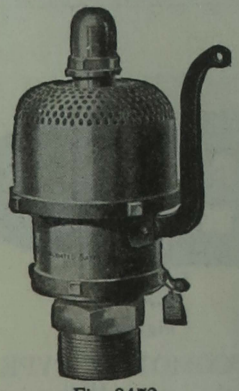


Fig. 3472
Muffler Type

Prevents the noise usually caused by escaping steam when a valve relieves.

This valve has been adopted for general use by the manufacturers of steam rollers and portable engines in districts where it is necessary to muffle the sound of escaping steam; effective and eliminates the trouble ordinarily experienced from open valves.

Furnished for working pressures as high as 200 pounds; and, when so ordered, to meet any State Boiler Laws or A. S. M. E. boiler Code.

Size, Inches	Height, Inches	Weight Each, Lbs.	Each
1	6 5/16	3	$15.00
1¼	7 3/16	5	20.00
1½	8 9/16	7¾	30.00
2	10½	13½	40.00

POP SAFETY VALVES

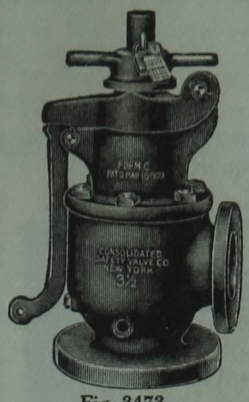


Fig. 3473

MARINE TYPE

Especially designed for marine service, complying with the specifications of the U. S. Steamboat Inspection Service, Lloyd's and other similar Bureaus.

Valve Base and Yoke cover of steel; seat bushing, feather and cover ring, nickel; compression screw and other mountings, bronze composition; spring of crucible spring steel; lever and cap malleable iron.

Size, Inches	Height, Inches	Diameter Flanges, Inches		Weight Each, Lbs.	Each
		Base	Outlet		
2	11½	6½	6	3	$60.00
2½	13	7½	7	50	70.00
3	16 1/16	8¼	7½	85	80.00
3½	17 5/16	9	8½	117	100.00
4	18¾	10	9	158	120.00
4½	20 5/8	10½	9¼	190	150.00
5	23⅛	11	10	290	190.00

WEIGHTED LEVER SAFETY VALVES

CROSS AND ANGLE PATTERNS

Levers are graduated from 40 to 100 pounds. If desired, any other graduation can be supplied to order, not to exceed 100 pounds.

Cross Safety Valves, sizes 1¼ inch and larger, will be furnished in iron, unless brass is specified.

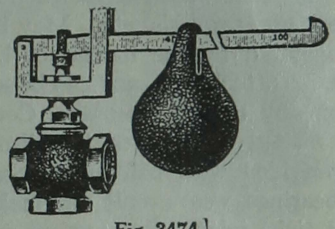


Fig. 3474

BRASS BODY

Size, Inches	With Cross Valve, Each	With Angle Valve, Each	Size, Inches	With Cross Valve, Each	With Angle Valve, Each
¼	$2.20	....	¼	$7.15	$7.15
⅜	2.50	$2.50	1½	9.00	9.00
½	3.25	3.25	2	12.50	12.50
¾	3.90	3.90	2½	22.50	....
1	4.70	4.70	3	33.50	.....

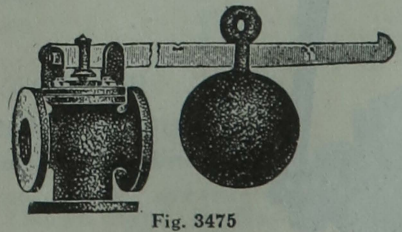


Fig. 3475

IRON BODY

Size, Inches	Screwed, Each	Flanged, Each	Size, Inches	Screwed, Each	Flanged, Each
1¼	$5.00	....	4	$28.75	$34.00
1½	5.80	....	4½	34.50	....
2	7.80	....	5	41.50	48.00
2½	13.25	....	6	57.75	65.00
3	17.25	....	7	93.50	100.00
3½	23.00	....	8	132.00	140.00

THROTTLE VALVES

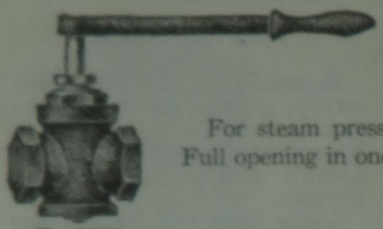


Fig. 3476

For steam pressures up to 125 pounds. Full opening in one-quarter turn.

Size, Inches	Screwed		Flanged		Iron Body, Each
	Brass Body, Each	Iron Body Brass Mounted, Each	Diameter Flanges, Inches	Face to Face, Inches	
¾	$10.00	.....	...	...	.....
1	11.50	$10.00	4	4½	$11.00
1¼	14.00	12.50	4½	5	13.50
1½	20.00	15.00	5	5½	16.50
2	25.00	22.50	6	6½	24.00
2½	35.00	30.00	7	7½	32.00
3	47.00	40.00	7½	8	42.50
3½	.....	50.00	8½	9	53.00
4	.....	60.00	9	10½	64.00

LEVER THROTTLE VALVES

BRASS BODY

Especially adapted for traction engines, sawmills, etc. May be operated by the handle or by a rod attachment, and can be set at any desired opening. Constructed of few parts. The discs, provided with ball and socket bearings, wear evenly and make a tight joint. Brass valves are provided with gunmetal disc carriers.

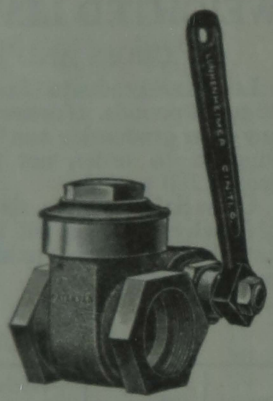


Fig. 3477

Size, Inches	Each	Size, Inches	Each
¾	$3.00	1½	$7.00
1	4.00	2	10.00
1¼	5.00	2½	19.00

Fig. 3478

IRON BODY

Same as brass body but of iron with brass trimmings.

Size, Inches	Each	Size, Inches	Each
2	$8.50	4	$33.00
2½	16.00	5	35.00
3	20.00	6	.....
3½	25.00	....	.....

TRIP GONGS

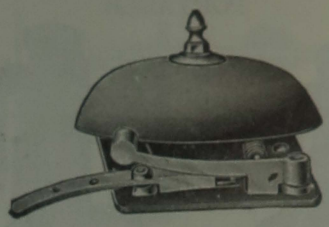


Fig. 3479

Polished wrought brass gong; **japanned** cast iron back plate and bell post; cast brass trip lever and hammer bar; leather hammer head; tempered brass wire coil springs.

For use in any place where opening and closing hours must be indicated by signal. Also used extensively for fire alarm signals. It can be handily arranged to ring on different floors in unison. Superior to the electric gongs because they are always ready for instant use, while the electric gongs are very uncertain. These gongs can be operated with up or down pull. Right hand sent unless otherwise specified, but the left hand can be furnished upon request. Gong is built substantially for hard usage and will not crack.

Sizes from 2 to 8 inches have metal hammers; larger sizes have wooden hammers.

Size, Inches	Weight per doz., Lbs.	Per Dozen	Size, Inches	Weight per doz., Lbs.	Per Dozen
2	11	$9.00	9	120	$70.00
3	14	10.00	10	132	84.00
4	19	12.50	12	192	150.00
5	26	16.50	14	306	212.00
6	33	24.00	15	366	236.00
7	63	34.00	16	420	260.00
8	75	46.00	18	492	310.00

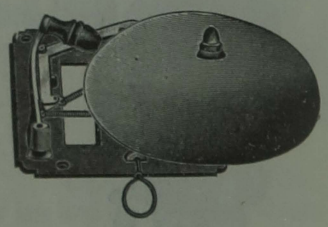


Fig. 3480

LOCOMOTIVE TYPE

Polished bell metal; **japanned** cast iron frame and bell post; plain brass lever and clapper; brass wire coil springs and brass pull. For attaching rope or other device as desired.

Especially useful on all cranes and construction work. Contains only five parts, all of which work in perfect unison with an exceedingly smooth action.

Size, Inches	Weight, Per Doz., Lbs.	Per Dozen
4	19	$12.50
5	26	16.50
6	33	24.00
7	63	34.00
8	75	46.00
10	132	84.00
12	192	150.00
14	306	212.00

WHISTLES

Brass steam whistles of the highest quality throughout in both material and workmanship. Made of seamless tubing, perfectly smooth on the inside and give a good, clear, resonant sound. The length of the bell in all cases is twice the diameter. Recommended for marine and stationary work, fire alarms, etc. For low pressure loosen acorn nut on top until whistle gives desired tone; for high pressure, vice versa.

FOR PRESSURES UP TO 125 POUNDS

PLAIN STEAM—STANDARD

Fig. 3481

Diameter Bell, Inches	Size Pipe Conn., Inches	Each
1	3/8	$2.20
1 1/4	1/2	2.75
1 1/2	1/2	3.00
2	3/4	4.35
2 1/2	3/4	5.25
3	1	7.25
3 1/2	1	9.50
4	1 1/4	12.00
5	1 1/2	19.00
6	2	24.00
8	2 1/2	70.00
10	2 1/2	175.00

PLAIN STEAM WITH VALVE

Diameter Bell, Inches	Size Pipe Conn., Inches	Each
1	3/8	$3.10
1 1/4	1/2	3.75
1 1/2	1/2	4.00
2	3/4	5.50
2 1/2	3/4	6.50
3	1	8.50
3 1/2	1	11.50
4	1 1/4	15.00
5	1 1/2	22.50
6	2	33.00
8	2 1/2	95.00
10	2 1/2	225.00

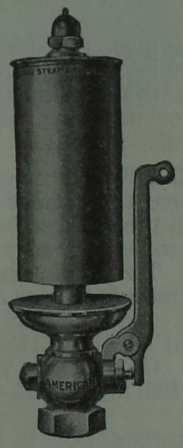


Fig. 3482

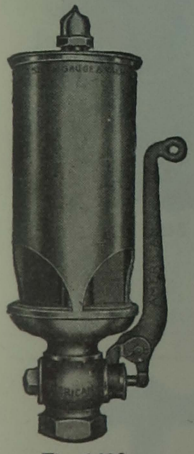


Fig. 3483

SINGLE BELL CHIMES WITH VALVE—SCREWED

Diameter Bell, Inches	Size Pipe Conn., Inches	Each
1 1/2	3/8	$7.50
2	1/2	8.00
3	3/4	14.00
4	1	20.00
5	1 1/4	35.00
6	1 1/2	50.00
8	2	110.00
10	2 1/2	210.00

SINGLE BELL CHIMES WITH COMPOUND VALVE —SCREWED

Diameter Bell, Inches	Size Pipe Conn., Inches	Each
5	1 1/4	$35.00
6	1 1/2	50.00
8	2	110.00
10	2 1/2	210.00

Fig. 3484

Fig. 3485

SINGLE BELL CHIMES WITHOUT VALVE—SCREWED

Diameter Bell, Inches	Size Pipe Conn. Inches	Each
1 1/2	3/8	$4.50
2	1/2	5.00
3	3/4	9.50
4	1	15.00
5	1 1/4	28.00
6	1 1/2	42.00
8	2	95.00
10	2 1/2	190.00

SINGLE BELL CHIMES WITHOUT VALVE—FLANGED

Prices for flanged type may be had on application.

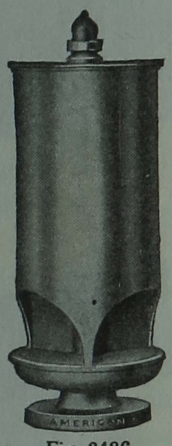


Fig. 3486

Fig. 3487

PLAIN WHISTLE VALVES—SCREWED

Size, Inches	Each
3/8	$2.00
1/2	2.50
3/4	3.00
1	3.50
1 1/4	5.00
1 1/2	6.00
2	9.00
2 1/2	18.00
3	27.00

COMPOUND WHISTLE VALVES—SCREWED

Furnished either screwed or flanged. Flanged type is illustrated, but price list applies to screwed type only.

Size, Inches	Screwed Each
1 1/4	$16.00
1 1/2	20.00
2	25.00
2 1/2	35.00
3	65.00

Prices on flanged type on application.

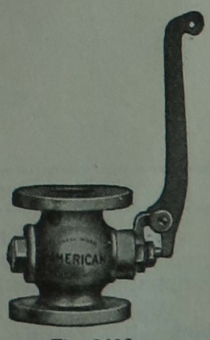


Fig. 3488

FAIRBANKS VULCABESTON BRONZE VALVES
GLOBE, ANGLE AND RADIATOR TYPES

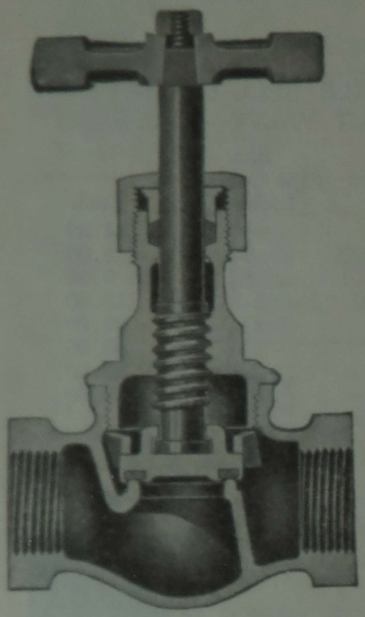


Fig. 3489

WITH RENEWABLE VULCABESTON RING DISC

Universal recognition is now given by engineers and experienced users to the superior results in service and to the added durability of globe valves secured by the preservation of the valve seat at the sacrifice of a comparatively inexpensive renewable disc.

These valves have a RAISED ROUND SEAT upon which scale, grit or other sediment will not lodge.

The valve seat is preserved from injury by the use of a comparatively soft ring in the renewable disc.

This ring is composed of Asbestos fiber to which a waterproof vulcanizing material is added by a patented process, making a composition which will neither crack nor flake off. It is held securely in position by the metal edges of the disc holder, which are spun over its inner and outer diameters.

The disc is guided centrally to its seat, without danger of binding, by splines cast in the body of the valve.

The quickness of renewals is made possible by the ease with which the disc may be removed from the end of the spindle without the manipulation of nuts, screws, pins, wires, or anything liable to become detached while the valve is in use.

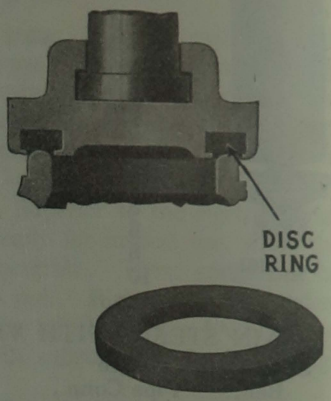


Fig. 3490

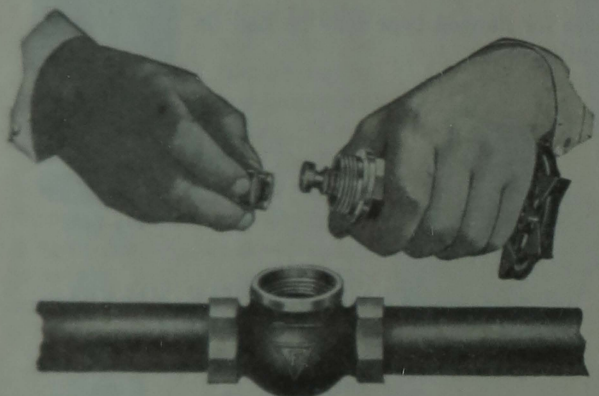


Fig. 3491

TO RENEW: Simply unscrew and remove the bonnet of the valve, slip the old disc from the end of spindle and substitute a new one. The whole operation requires but a few moments and no skill, and DOES NOT NECESSITATE THE REMOVAL OF THE VALVE BODY FROM THE PIPE LINE.

The Stuffing Box is packed with a specially moulded vulcabeston ring, which is durable and cannot be blown or washed out. The packing ring is held in place by a follower gland, except in the ¼-inch and ⅜-inch sizes.

Valves can be packed under pressure when wide open.

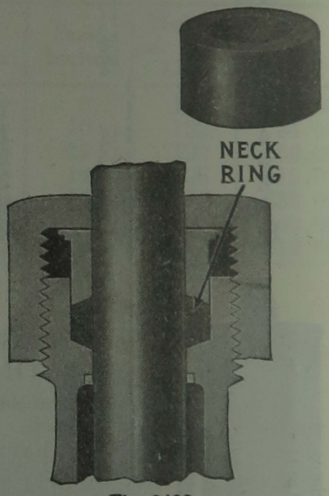


Fig. 3492

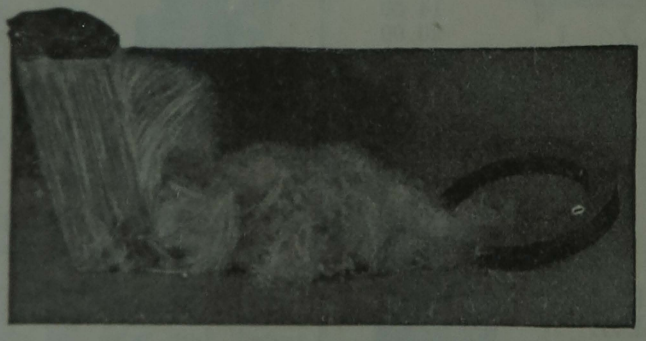


Fig. 3493

FROM MINERAL TO DISC RING

The block at the left of the illustration is a piece of Asbestos just as it comes from the mine. It is a bright greenish stone, hard and cold and heavy. It can be shredded into white floss as smooth and fine as silk, and is remarkably strong. As everybody knows, Asbestos Fiber is not affected by heat or acids.

Vulcabeston is a compound of Asbestos Fiber, saturated with rubber and other materials, and vulcanized under hydraulic pressure. It is the ideal material for a valve seat. You can get it only in Fairbanks Valves with Renewable Discs.

Complete Valve Catalogue will be sent on request

FAIRBANKS VULCABESTON BRONZE VALVES
RENEWABLE VULCABESTON RING DISC

These valves have a RAISED ROUND SEAT upon which scale, grit or other sediment will not lodge. The seat is thus preserved from injury by the use of a comparatively soft ring in the renewable disc.

TO RENEW Ring Disc, simply unscrew and remove the bonnet of the valve, slip the old disc from the end of spindle and substitute a new one. The whole operation requires but a few moments and no skill, and DOES NOT NECESSITATE THE REMOVAL OF THE VALVE BODY FROM THE PIPE LINE.

GLOBE TYPE

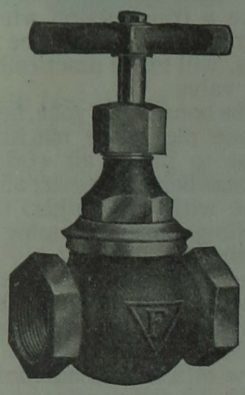


Fig. 3494
Screw End

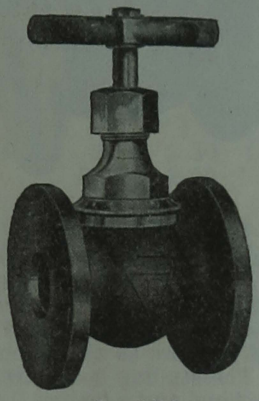


Fig. 3495
Flange End

WITH FOLLOWER GLAND

300 Pounds Hydraulic Test Pressure
150 Pounds Steam Working Pressure
175 Pounds Water Working Pressure

Size, Inches	Screw End		Flange End	
	End to End, Inches	Each	Face to Face, Inches	Each
1/8	1 9/16	$1.10	....	.....
1/4	1 13/16	1.10	....	.....
3/8	2 1/16	1.25	....	.....
1/2	2 3/4	1.60	2 7/8	$4.00
3/4	3 3/16	2.20	3 1/4	5.00
1	3 11/16	2.80	3 13/16	6.00
1 1/4	4 3/16	4.00	4 3/8	9.00
1 1/2	4 3/4	5.50	4 13/16	11.00
2	5 7/8	8.75	6	16.50
2 1/2	6 7/16	15.75	6 7/16	25.00
3	7 1/4	22.00	7 1/16	34.00

ANGLE TYPE

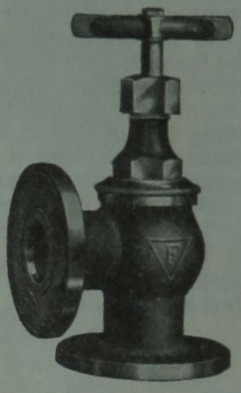


Fig. 3496
Screw End

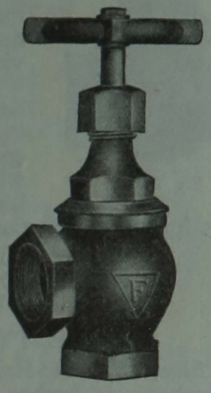


Fig. 3497
Flange End

WITH FOLLOWER GLAND

300 Pounds Hydraulic Test Pressure
150 Pounds Steam Working Pressure
175 Pounds Water Working Pressure

Size, Inches	Screw End		Flange End	
	Center to End, Inches	Each	Center to Face, Inches	Each
1/4	1 5/16	$1.10	....	.....
3/8	1	1.25	....	.....
1/2	1 1/2	1.60	2 1/4	$4.00
3/4	1 11/16	2.20	2 5/8	5.00
1	1 13/16	2.80	3	6.00
1 1/4	2 3/16	4.00	3 1/4	9.00
1 1/2	2 3/8	5.50	3 5/8	11.00
2	2 13/16	8.75	4 1/16	16.50
2 1/2	3 5/16	15.75	4 9/16	25.00
3	4	22.00	5 1/16	34.00

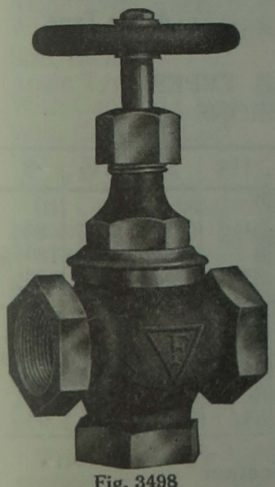


Fig. 3498

CROSS TYPE

300 Pounds Hydraulic Pressure
150 Pounds Steam Working Pressure
175 Pounds Water Working Pressure

SCREW END

Size, Inches	End to End, Inches	Center to Bottom Inlet, Inches	Each
1/2	2 13/16	1 7/16	$2.25
3/4	3 3/16	1 5/8	2.50
1	3 5/8	1 13/16	3.25
1 1/4	4 3/16	2 3/16	4.75
1 1/2	4 3/4	2 3/8	6.25
2	5 15/16	2 13/16	9.50
2 1/2	6 3/8	3 1/8	20.00
3	7 1/16	3 3/8	30.00

FAIRBANKS HEAVY BRONZE VALVES

BEVEL DISC
SCREW HUB FOLLOWER GLAND

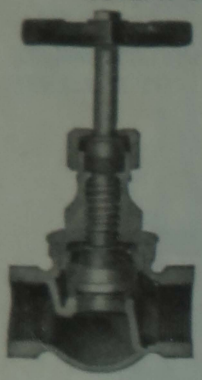


Fig. 3499

Fairbanks Heavy Bronze Globe Valves are designed for severe service.

The disc is of the well-known Fairbanks Renewable Horse-shoe type, with a projecting lip to prevent wire drawing.

A special packing under pressure feature is introduced, the joint being made by contact of the top of the disc with the special shoulder provided in the bonnet.

The Fairbanks design of guides employed insures perfect seating.

The Stuffing Box is packed with a specially molded vulcabeston ring, which is durable and cannot be blown or washed out, being held in place by a follower gland.

400 Pounds Hydraulic Test Pressure
200 Pounds Steam Working Pressure
250 Pounds Water Working Pressure

GLOBE TYPE

Size, Inches	End to End, Inches	Each
½	2¾	$1.60
¾	3 3/16	2.25
1	3 11/16	2.80
1¼	4 3/16	4.00
1½	4¾	5.50
2	5⅞	8.75
2½	6 7/16	15.25
3	7¼	22.00

ANGLE TYPE

Size, Inches	Center to End, Inches	Each
½	1½	$1.60
¾	1 11/16	2.20
1	1 13/16	2.80
1¼	2 3/16	4.00
1½	2⅜	5.50
2	2 13/16	8.75
2½	3 5/16	15.75
3	4	22.00

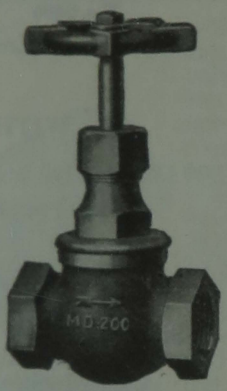


Fig. 3500

FAIRBANKS EXTRA HEAVY MARINE BRONZE VALVES

BEVEL DISC
SCREW HUB FOLLOWER GLAND

Our Marine Bronze Globe Valve is similar in design to our Heavy Bronze Globe Valve, but of special Fairbanks Marine Bronze Composition, one of the highest grade mixtures used in valve manufacture, and is specially designed for marine and extreme high pressure service.

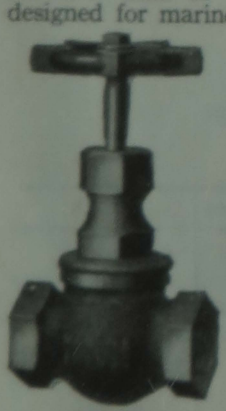


Fig. 3501

800 Pounds Hydraulic Test Pressure
250 Pounds Steam Working Pressure
350 Pounds Water Working Pressure

Size, Inches	Globe Type, End to End, Inches	Angle Type, Center to End, Inches	Angle or Globe, Each
½	2¾	1½	$1.60
¾	3 3/16	1 11/16	2.20
1	3 11/16	1 13/16	2.80
1¼	4 3/16	2 3/16	4.00
1½	4¾	2⅜	5.50
2	5⅞	2 13/16	8.75
2½	6 7/16	3 5/16	15.75
3	7¼	4	22.00

FAIRBANKS EXTRA HEAVY MARINE BRONZE VALVES

WITH BOLTED BONNET

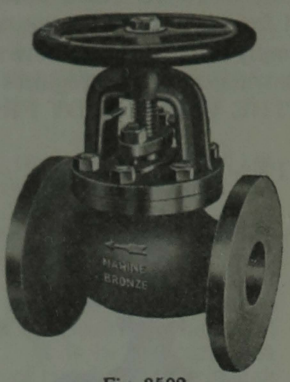


Fig. 3502
Globe Type

The globe shape body of this valve has the metal distributed throughout its entire shape so as to make the strongest construction possible.

The screwed-in ring of nickel bronze and the renewable disc of nickel bronze make a construction which, by renewing either one or both, will make practically a new valve.

The bonnet and yoke, being of one piece, are machined so as to insure all working surfaces being in perfect alignment with each other, thus avoiding any cramping or straining in assembling or operating the valve.

The body, being recessed to take the gasket between the body and bonnet, provides a feature which will not allow the gasket to blow out or become damaged with the greatest pressure to which this valve may be subjected.

The stuffing box allows the use of a liberal amount of packing, and a feature that is appreciated by engineers and others who have to pack valves is the lugs at the sides of the yoke which hold the follower up and out of the way while the stuffing box is being packed.

The handwheel is of such size and shape as to allow the valve to be closed or opened with the least amount of effort and still not damage the valve.

Taking this valve as a whole, it is the most suitable valve in its class for the service for which it has been designed. We feel that it is the best valve of this type on the market.

800 Pounds Hydraulic Test Pressure
250 Pounds Steam Working Pressure
350 Pounds Water Working Pressure

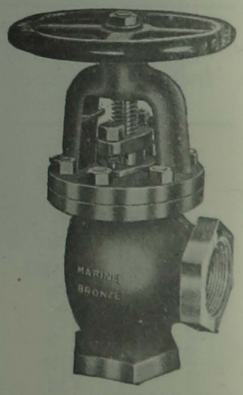


Fig. 3503
Angle Type

GLOBE AND ANGLE TYPES
DETAIL DIMENSIONS

SIZE	1½	2	2½	3
Face to Face, Flange End, Globe	7	8	9	10
End to End, Screw End, Globe	5 15/16	6¾	7⅝	8⅝
Center to Top, Globe, Closed	8	8 25/32	9 13/16	10 15/16
Center to Top, Globe, Open	8¾	9 21/32	10⅞	12 3/16
Center to Face, Flange End, Angle	3 11/16	4	4 9/16	5 7/16
Center to End, Screw End, Angle	2 21/32	3⅜	3 13/16	4 5/16
Center to Top, Angle, Closed	7⅞	8 11/16	9 9/16	10 11/16
Center to Top, Angle, Open	8¾	9¾	10 13/16	12 5/16
Diameter of Flanges	6	6½	7½	8¼
Diameter of Handwheel	6¾	7¾	8½	9½

Prices on Application

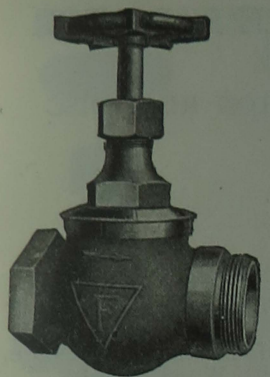


Fig. 3504

FAIRBANKS BRONZE HOSE VALVES

RENEWABLE DISC

GLOBE TYPE

For Water Working Pressure up to 200 Lbs.
Rough Body, Finished Trimmings; Screw Inlet, Hose Thread Outlet.

With Iron Wheel				
Size, Inches	½	¾	1	1¼
Globe Type, Each	$2.10	2.70	3.30	4.70
With Cap and Chain, Each	$4.00	5.00	7.00	
Size, Inches	1½	2	2½	3
Globe Type, Each	$6.50	9.90	17.10	23.50
With Cap and Chain, Each	$9.50	15.00	22.00	30.00
With Bronze Wheel				
Size, Inches	½	¾	1	1¼
Globe Type, Each	$2.75	3.35	4.00	5.50
With Cap and Chain, Each	$4.65	5.75	7.80	
Nickel Plated, Each	$3.20	3.80	4.40	5.90
Nickel Plated, with Cap and Chain, Each	$5.05	6.15	8.20	
Size, Inches	1½	2	2½	3
Globe Type, Each	$7.50	12.00	20.00	26.50
With Cap and Chain, Each	$10.50	16.50	24.80	32.80
Nickel Plated, Each	$7.90	12.40	20.60	27.10
Nickel Plated, with Cap and Chain, Each	$10.90	16.90	25.40	33.40

ANGLE TYPE

For Water Working Pressure up to 200 Lbs.

Rough Body, Finished Trimmings, Screw Inlet, Hose Thread Outlet.

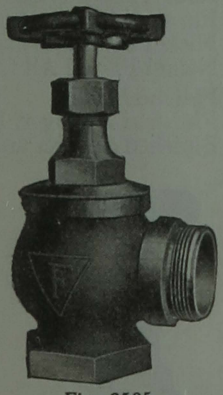


Fig. 3505

With Iron Wheel				
Size, Inches	½	¾	1	1¼
Angle Type, Each	$2.10	2.70	3.30	4.70
With Cap and Chain, Each	$4.00	5.00	7.00	
Size, Inches	1½	2	2½	3
Angle Type, Each	$6.50	9.90	17.10	23.50
With Cap and Chain, Each	$9.50	15.00	22.00	30.00
With Bronze Wheel				
Size, Inches	½	¾	1	1¼
Angle Type, Each	$2.75	3.35	4.00	5.50
With Cap and Chain, Each	$4.65	5.75	7.80	
Nickel plated, Each	$3.20	3.80	4.40	5.90
Nickel Plated, with Cap and Chain, Each	$5.05	6.15	8.20	
Size, Inches	1½	2	2½	3
Angle Type, Each	$7.50	12.00	20.00	26.50
With Cap and Chain, Each	$10.50	16.50	24.80	32.80
Nickel Plated, Each	$7.90	12.40	20.60	27.10
Nickel Plated, with Cap and Chain, Each	$10.90	16.90	25.40	33.40

Prices on above Valves with Flange Inlet furnished on application.

FAIRBANKS BRONZE RADIATOR VALVES

RENEWABLE VULCABESTON RING DISC

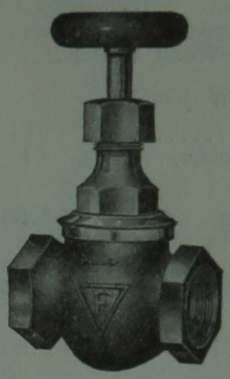


Fig. 3506

GLOBE TYPE

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

SCREW END

Size, Inches	¼	⅜
End to End, Inches	.....	.....
Rough Body With		
Finished Trimmings, Each	$1.50	1.85
Nickel Plated Trimmings, Each	$1.80	2.15
Nickel Plated, All Over, Each	$1.90	2.25
Finished Body		
Finished All Over, Each	$2.00	2.25
Finished All Over and Nickel Plated, Each	$2.40	2.70

Size, Inches	½	¾	1	1¼	1½	2
End to End, Inches	2¾	3 3/16	3 1/16	4 3/16	4¾	5⅞
Rough Body With						
Finished Trimmings, Each	$2.00	2.50	3.20	4.50	6.25	10.50
Nickel Plated Trimmings, Each	$2.30	2.80	3.50	4.80	6.55	10.80
Nickel Plated All Over, Each	$2.40	2.90	3.60	4.90	6.65	10.90
Finished Body						
Finished All Over, Each	$2.50	3.00	3.75	5.25	7.25	11.75
Finished All Over and Nickel Plated, Each	$2.90	3.40	4.15	5.65	7.65	12.15

These prices cover Wood Handle, Tee Handle, Square on Stem, or Lockshield.

MALE UNION OUTLET

300 Pounds, Hydraulic Test Pressure.

Furnished with Wood Wheels.

These prices cover Wood Handle, Tee Handle, Square on Stem, or Lockshield.

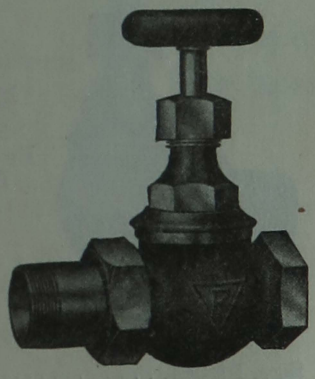


Fig. 3507

Size, Inches	½	¾	1
Screw End to Union End, Inches	4¼	4⅞	5⅝
Rough Body With			
Finished Trimmings, Each	$2.75	3.50	4.30
Nickel Plated Trimmings, Each	$3.05	3.80	4.60
Nickel Plated All Over, Each	$3.15	3.90	4.70
Finished Body			
Finished All Over, Each	$3.20	4.00	4.80
Finished All Over and Nickel Plated	$3.60	4.40	5.20

Size, Inches	1¼	1½	2
Screw End to Union End, Inches	6¼	6⅞	7⅞
Rough Body With			
Finished Trimmings, Each	$5.85	7.75	12.60
Nickel Plated Trimmings, Each	$6.15	8.05	12.90
Nickel Plated All Over, Each	$6.25	8.15	13.00
Finished Body			
Finished All Over, Each	$6.40	8.75	13.85
Finished All Over and Nickel Plated, Each	$6.80	9.15	14.25

FAIRBANKS BRONZE RADIATOR VALVES

RENEWABLE VULCABESTON RING DISC
ANGLE TYPE

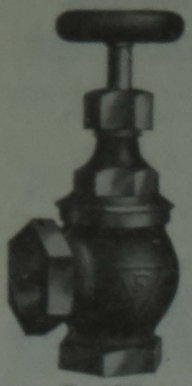


Fig. 3508

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

SCREW END

Size, Inches	¼	⅜
Center to End, Inches	1 5/16	1
Rough Body With		
Finished Trimmings, Each	$1.50	1.85
Nickel Plated Trimmings, Each	$1.80	2.15
Nickel Plated All Over, Each	$1.90	2.25
Finished Body		
Finished All Over, Each	$2.00	2.25
Finished All Over and Nickel Plated, Each	$2.40	2.70

Size, Inches	½	¾	1	1¼	1½	2
Center to End, Inches	1 7/16	1 11/16	1⅞	2¼	2 7/16	2 11/16
Rough Body With						
Finished Trimmings, Each	$2.00	2.50	3.20	4.50	6.25	10.50
Nickel Plated Trimmings, Each	$2.30	2.80	3.50	4.80	6.55	10.80
Nickel Plated All Over, Each	$2.40	2.90	3.60	4.90	6.65	10.90
Finished Body						
Finished All Over Each	$2.50	3.00	3.75	5.25	7.25	11.75
Finished All Over and Nickel Plated, Each	$2.90	3.40	4.15	5.65	7.65	12.15

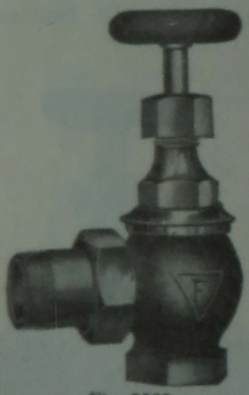


Fig. 3509

MALE UNION OUTLET

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

Size, Inches	½	¾	1
Center to Union End, Inches	2¾	3⅜	3⅝
Rough Body With			
Finished Trimmings, Each	$2.75	3.50	4.30
Nickel Plated Trimmings, Each	$3.05	3.80	4.60
Nickel Plated All Over, Each	$3.15	3.90	4.70
Finished Body			
Finished All Over, Each	$3.20	4.00	4.80
Finished All Over and Nickel Plated, Each	$3.60	4.40	5.20

Size, Inches	1¼	1½	2
Center to Union End, Inches	4⅛	4⅜	4 15/16
Rough Body With			
Finished Trimmings, Each	$5.85	7.75	12.60
Nickel Plated Trimmings, Each	$6.15	8.05	12.90
Nickel Plated All Over, Each	$6.25	8.15	13.00
Finished Body			
Finished All Over, Each	$6.40	8.75	13.85
Finished all over and Nickel Plated, Each	$6.80	9.15	14.25

These Prices cover Wood Handle, Tee Handle, Square on Stem or Lockshield.

FAIRBANKS BRONZE RADIATOR VALVES

RENEWABLE VULCABESTON RING DISC

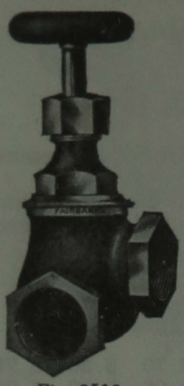


Fig. 3510

CORNER TYPE OFFSET PATTERN

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

RIGHT HAND—SCREW END

Size, Inches	½	¾	1
Center to Outlet End, Inches	....	1 11/16	1 13/16
Center to Inlet End, Inches	....	1⅝	1 13/16
Offset, Inches	....	1	⅞
Rough Body With			
Finished Trimmings, Each	$2.25	2.75	3.50
Nickel Plated Trimmings, Each	$2.55	3.05	3.80
Nickel Plated All Over, Each	$2.65	3.15	3.90
Finished Body			
Finished All Over, Each	$2.75	3.25	4.25
Finished All Over and Nickel Plated, Each	$3.15	3.65	4.65

Size, Inches	1¼	1½	2
Center to End, Inches	2 1/16	2 5/16	2⅝
Center to Inlet End, Inches	2 1/16	2 5/16	2⅞
Offset, Inches	1 1/16	1⅜	1¾
Rough Body With			
Finished Trimmings, Each	$5.00	7.00	11.55
Nickel Plated Trimmings, Each	$5.30	7.30	11.85
Nickel Plated All Over, Each	$5.40	7.40	11.95
Finished Body			
Finished All Over, Each	$5.75	8.00	12.95
Finished All Over and Nickel Plated, Each	$6.15	8.40	13.35

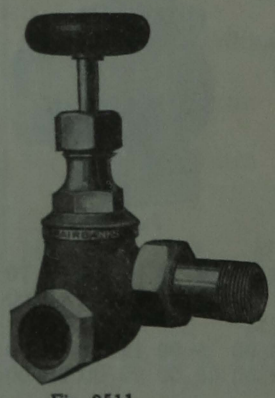


Fig. 3511

RIGHT HAND—MALE UNION OUTLET

300 Pounds Hydraulic Test pressure.
Furnished with Wood Wheels.

Size, Inches	¾	1	1¼	1½	2
Center to Nipple End, Inches	3 7/16	3⅞	4⅜	4⅝	5 5/16
Offset, Inches	1	⅞	1 1/16	1⅜	1¾
Rough Body With					
Finished Trimmings, Each	$3.85	4.75	6.45	8.55	13.85
Nickel Plated Trimmings, Each	$4.15	5.05	6.85	8.85	14.15
Nickel Plated All Over, Each	$4.25	5.15	6.95	8.95	14.25
Finished Body					
Finished All Over, Each	$4.40	5.30	7.05	9.65	15.25
Finished All Over and Nickel Plated, Each	$4.80	5.70	7.45	10.05	15.65

Above Prices cover Wood Handle, Tee Handle, Square on Stem or Lockshield.

FAIRBANKS BRONZE RADIATOR VALVES

RENEWABLE VULCABESTON

RING DISC

CORNER TYPE
OFFSET PATTERN

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

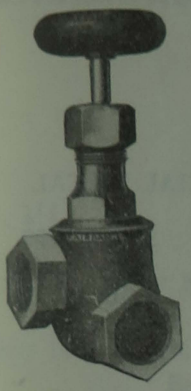


Fig. 3512 LEFT END—SCREW END

Size, Inches	½	¾	1
Center to Outlet End, Inches		1 11/16	1 13/16
Center to Inlet End, Inches		1 5/8	1 13/16
Offset, Inches		1	7/8
Rough Body With			
Finished Trimmings, Each	$2.25	2.75	3.50
Nickel Plated Trimmings, Each	$2.55	3.05	3.80
Nickel Plated All Over, Each	$2.65	3.15	3.90
Finished Body			
Finished All Over, Each	$2.75	3.25	4.25
Finished All Over and Nickel Plated, Each	$3.15	3.65	4.65
Size, Inches	1¼	1½	2
Center to Outlet End, Each	2 1/16	2 5/16	2 5/8
Center to Inlet End, Inches	2 1/16	2 5/16	2 7/8
Offset, Inches	1 1/16	1 3/8	1¾
Rough Body With			
Finished Trimmings, Each	$5.00	7.00	11.55
Nickel Plated Trimmings, Each	$5.30	7.30	11.85
Nickel Plated All Over, Each	$5.40	7.40	11.95
Finished Body			
Finished All Over, Each	$5.75	8.00	12.95
Finished All Over and Nickel Plated, Each	$6.15	8.40	13.35

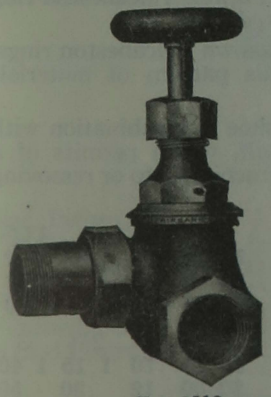


Fig. 3513

LEFT HAND
MALE UNION OUTLET

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

Size, Inches	¾	1	1¼	1½	2
Center to Nipple End, Inches	3 7/16	3 7/8	4 3/8	4 5/8	5 5/16
Offset, Inches	1	7/8	1 1/16	1 3/8	1¾
Rough Body With					
Finished Trimmings, Each	$3.85	4.75	6.45	8.55	13.85
Nickel Plated Trimmings, Each	$4.15	5.05	6.85	8.85	14.15
Nickel Plated All Over, Each	$4.25	5.15	6.95	8.95	14.25
Finished Body					
Finished All Over, Each	$4.40	5.30	7.05	9.65	15.25
Finished All Over and Nickel Plated, Each	$4.80	5.70	7.45	10.05	15.65

Prices cover Wood Handle, Tee Handle, Square on Stem or Lock Shield

FAIRBANKS BRONZE RADIATOR VALVES

RENEWABLE VULCABESTON RING DISC

GLOBE TYPE
OFFSET PATTERN

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

Fig. 3514 SCREW END

Size, Inches	½	¾	1
End to End, Inches		3 3/16	3 3/8
Offset, Inches		1 5/16	1
Rough Body With			
Finished Trimmings, Each	$2.25	2.75	3.50
Nickel Plated Trimmings, Each	$2.55	3.05	3.80
Nickel Plated All Over, Each	$2.65	3.15	3.90
Finished Body			
Finished All Over, Each	$2.75	3.25	4.25
Finished All Over and Nickel Plated, Each	$3.15	3.65	4.65
Size, Inches	1¼	1½	2
End to End, Inches	4¼	4 7/8	5¾
Offset, Inches	1 3/16	1 7/16	1¾
Rough Body With			
Finished Trimmings, Each	$5.00	7.00	11.55
Nickel Plated Trimmings, Each	$5.30	7.30	11.85
Nickel Plated All Over, Each	$5.40	7.40	11.95
Finished Body			
Finished All Over, Each	$5.75	8.00	12.95
Finished All Over and Nickel Plated, Each	$6.15	8.40	13.35

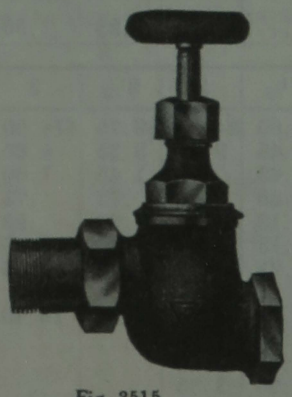


Fig. 3515

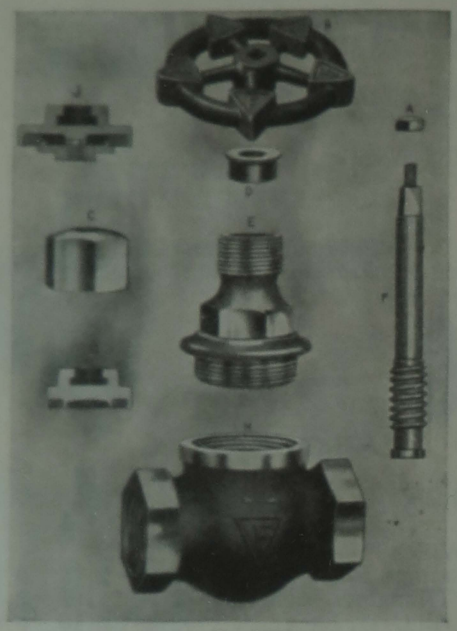
MALE UNION OUTLET

300 Pounds Hydraulic Test Pressure.
Furnished with Wood Wheels.

Size, Inches	¾	1	1¼	1½	2
End to End, over Nipple, Inches	5 1/16	5 11/16	6½	7 1/16	8 1/8
Offset, Inches	1 5/16	1	1 3/16	1 7/16	1¾
Rough Body With					
Finished Trimmings, Each	$3.85	4.75	6.45	8.55	13.85
Nickel Plated Trimmings, Each	$4.15	5.05	6.85	8.85	14.15
Nickel Plated All Over, Each	$4.25	5.15	6.95	8.95	14.25
Finished Body					
Finished All Over, Each	$4.40	5.30	7.05	9.65	15.25
Finished All Over and Nickel Plated, Each	$4.80	5.70	7.45	10.05	15.65

FAIRBANKS VULCABESTON BRONZE VALVES

PARTS FOR GLOBE AND ANGLE VALVES



A—Wheel Stem Nut
B—Wheel
C—Packing Nut
D—Follower Gland
E—Bonnet
F—Spindle
G—Regular Disc
H—Body
J—Special Disc

Fig. 3516

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

Sizes, Inches	¼	⅜	½	¾	1
Bodies, Each	$0.56	$0.65	$0.75	$1.00	$1.25
Hubs, Each	.16	.22	.48	.68	.96
Spindles, Each	.....	.11	.20	.26	.35
Packing Nuts, Each	.08	.08	.15	.20	.27
Followers, Each	.....	.....	.04	.06	.08
Handwheels, Each	.04	.04	.04	.05	.07
Wheel Nuts, Per 100	.50	.50	.50	1.00	1.00
Trimmings Complete	.66	.77	1.28	1.71	2.30
Unions, Complete	.....	.....	.50	.63	.90
Union Nuts, Each	.....	.....	.25	.30	.40
Union Nipples, Each	.....	.....	.25	.33	.50

Sizes, Inches	1¼	1½	2	2½	3
Bodies, Each	$2.00	$2.60	$4.50	$8.75	$14.00
Hubs, Each	1.14	1.45	2.25	3.35	4.60
Spindles, Each	.46	.63	.92	1.45	1.60
Packing Nuts, Each	.27	.38	.45	.73	.73
Followers, Each	.09	.13	.15	.20	.20
Handwheels, Each	.08	.13	.16	.40	.48
Wheel Nut, Per 100	1.25	1.25	1.75	1.75	1.75
Trimmings, Complete	2.75	3.70	5.25	8.30	10.80
Unions, Complete	1.25	1.85	3.50	.....	.....
Union Nuts, Each	.55	.85	1.65	.....	.....
Union Nipples, Each	.70	1.00	1.85	.....	.....

Fig. 3517

DISCS

Section

Fig. 3518

Vulcabeston Ring, Bronze Holder.

Size, Inches	⅛	¼	⅜	½	¾	1
Each	$0.14	.14	.08	.10	.13	.17
Size, Inches		1¼	1½	2	2½	3
Each		$0.24	.32	.48	.80	1.10

Prices of ⅛ and ¼ inch include Spindles, as Disc Holder and Spindles are one piece.

Fig. 3519

BRONZE HOLDERS WITH SPECIAL METAL

Size, Inches	½	¾	1	1¼
Each	$0.12	.16	.20	.30
Size, Inches	1½	2	2½	3
Each	$0.40	.60	1.10	1.65

Fig. 3520

BRONZE HOLDERS WITH NUTS AND WASHERS VULCABESTON RINGS

Size, Inches	½	¾	1	1¼
Each	$0.15	.20	.25	.35
Size, Inches	1½	2	2½	3
Each	$0.50	.90	1.60	2.00

Disc rings for Fig. 3520 can be furnished of materials designed for special service.

SPECIAL GLOBE VALVE DISC HOLDERS

Fig. 3521

Fig. 3522

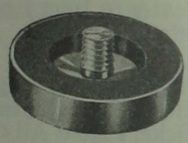


Fig. 3523

To meet special requirements we have designed the style of disc illustrated above.

By unscrewing the holding plate, the old ring may be easily removed from the shell and a new vulcabeston ring or one of other material substituted.

We regularly furnish our well-known vulcabeston rings, but we can supply discs of this pattern of materials designed for special service.

This holder features our horseshoe in combination with a separate part complete in itself, which permits of a simple and efficient method for attaching it to or removing it from the end of the spindle.

Size, Inches	½	¾	1	1¼
Bronze Disc Holders, Each	$0.10	.12	.15	.22
Bronze Disc Holder Nuts, Each	$0.02	.03	.05	.06
Vulcabeston Rings, Each	$0.05	.06	.07	.09
Size, Inches	1½	2	2½	3
Bronze Disc Holders, Each	$0.40	.70	1.15	1.40
Bronze Disc Holder Nuts, Each	$0.09	.12	.30	.50
Vulcabeston Rings, Each	$0.11	.13	.23	.26

Fig. 3524

FANCY BRONZE WHEELS

Size, Inches	¼	⅜	½	¾	1
Diameter, Inches	$1\frac{15}{16}$	$1\frac{15}{16}$	$2\frac{5}{16}$	$2\frac{5}{8}$	3
Finished, Each	$0.75	.75	.85	1.00	1.00
Nickel Plated, Each	$0.85	.85	.95	1.10	1.10
Size, Inches	1¼	1½	2	2½	3
Diameter, Inches	$3\frac{3}{8}$	$3\frac{3}{4}$	$4\frac{1}{8}$	5	6
Finished, Each	$1.25	1.60	1.80	3.10	4.30
Nickel Plated, Each	$1.35	1.70	1.90	3.30	4.50

FAIRBANKS BRONZE VALVE PARTS

HAND WHEELS

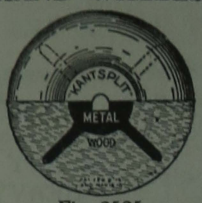


Fig. 3525

"KANTSPLIT" WOOD
NO. 024

Sizes ¼ to 2 Inch, Each $0.25. Per Dozen, $2.50.

Bronze Cap and Chain

Fig. 3526

Size, Inches	¾	1	1¼
Finished, Each	$0.60	.75	1.00
Nickel Plated, Each	$0.85	1.00	1.25
Size, Inches	1½	2	2½
Finished, Each	$1.20	1.70	2.50
Nickel Plated, Each	$1.45	1.95	2.85

Bronze Tee Handles

Fig. 3527

Size, Inches	½	¾	1
Finished, Each	$0.65	.65	.65
Nickel Plated, Each	$0.75	.75	.75
Size, Inches	1¼	1½	2
Finished, Each	$0.75	.80	1.00
Nickel Plated, Each	$0.85	.90	1.10

Bronze Tee Handle Tees

Fig. 3528

Size, Inches	½	¾	1
Finished, Each	$0.75	.75	.75
Nickel Plated, Each	$0.85	.85	.85
Size, Inches	1¼	1½	2
Finished, Each	$1.00	1.00	1.25
Nickel Plated, Each	$1.10	1.10	1.35

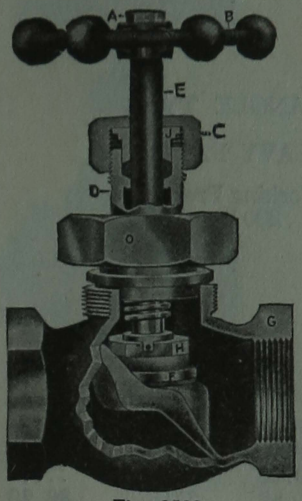
Bronze Lockshields

Fig. 3529

Size, Inches	½	¾	1
Finished, Each	$0.75	.75	.75
Nickel Plated, Each	$0.85	.85	.85
Size, Inches	1¼	1½	2
Finished, Each	$1.00	1.00	1.25
Nickel Plated, Each	$1.10	1.10	1.35

FAIRBANKS BRONZE REGRINDING VALVES

HEAVY PATTERN



A—Wheel Stem Nut
B—Wheel
C—Packing Nut
D—Hub
E—Spindle
F—Disc
G—Body
H—Disc Lock Nut
J—Follower Gland
O—Hub Lock Nut

Fig. 3530

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

This type of valve can be repaired by regrinding the seating surfaces, without the labor and expense of disconnecting pipes.

These valves are made of the highest grade bronze metal.

The sectional view shows the design of the seat, the disc and the body.

The use of outside body threads and a union ring makes a strong and rigid valve, and the design also insures protection against the corrosive effect which steam has upon inside body threads.

TO REGRIND: Unscrew the union ring and remove the trimmings from the body of the valve, insert a wire pin through the slot in the lock nut and the hole in the valve stem and, after placing upon the disc a small quantity of powdered sand or glass mixed with oil, replace the trimmings. Leave the union ring unscrewed so that the hub may rotate in the body of the valve and act as a guide for the stem during the process of regrinding.

GLOBE TYPE

For Working Pressures up to 200 Pounds.

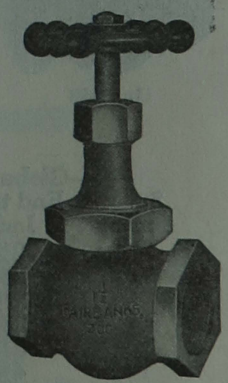


Fig. 3531

Size, Inches	Screw End, End to End, Inches	Screw End, End to End, Each	Flange End, Face to Face, Inches	Flange End, Face to Face, Each
¼	2 1/32	$0.70	...	.....
⅜	2⅛	.85	2⅞	$2.20
½	2 7/16	1.15	3⅝	3.40
¾	2⅞	1.45	4 3/16	4.70
1	3 11/32	2.00	4⅝	5.80
1¼	3⅞	2.80	4⅞	8.00
1½	4 5/16	3.90	5⅞	11.00
2	5¼	6.20	6⅞	14.50
2½	6 7/16	12.00	7 13/16	21.00
3	7 9/16	16.50	8 7/16	29.00

FAIRBANKS BRONZE REGRINDING VALVES

Fig. 3532

ANGLE TYPE

HEAVY PATTERN

For Working Pressure up to 200 Pounds.

Size, Inches	Screw End — Center to End, Inches	Screw End — Each	Flange End — Center to Face, Inches	Flange End — Each
1/4	1	$0.70	....	....
3/8	1	.85	1 21/32	$2.20
1/2	1 3/16	1.15	1 31/32	3.40
3/4	1 3/8	1.45	2 1/4	4.70
1	1 5/8	2.00	2 17/32	5.80
1 1/4	1 7/8	2.80	2 13/16	8.00
1 1/2	2 1/8	3.90	3 3/32	11.00
2	2 9/16	6.20	3 5/8	14.50
2 1/2	3 5/16	12.00	4 3/16	21.00
3	3 3/4	16.50	4 15/32	29.00

Fig. 3533

GLOBE TYPE
ANGLE TYPE

EXTRA HEAVY PATTERN

For Working Pressure up to 300 Pounds.

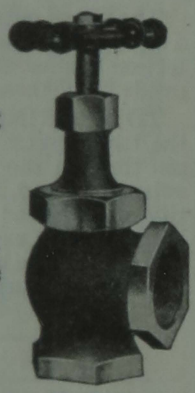


Fig. 3534

SCREW END

Size, Inches	Globe Type — End to End, Inches	Globe Type — Each	Angle Type — Center to End, Inches	Angle Type — Each
1/4	2 1/4	$0.90	1	$0.90
3/8	2 7/16	1.10	1 3/16	1.10
1/2	2 23/32	1.50	1 9/32	1.50
3/4	3 1/32	2.30	1 9/16	2.30
1	3 3/4	3.60	1 13/16	3.60
1 1/4	4 9/32	5.10	2 3/32	5.10
1 1/2	4 7/8	7.10	2 3/8	7.10
2	5 7/8	10.90	2 25/32	10.90
2 1/2	7 1/16	19.50	3 11/16	19.50
3	7 7/8	29.00	4 1/8	29.00

FLANGE END

Size, Inches	Globe Type — Face to Face, Inches	Globe Type — Each	Angle Type — Center to Face, Inches	Angle Type — Each
1	4 1/4	$7.60	3	$7.60
1 1/4	5 1/4	11.00	3 9/32	11.00
1 1/2	6 1/8	14.00	3 13/16	14.00
2	7 3/8	20.00	4 1/8	20.00
2 1/2	8 5/16	32.00	4 11/16	32.00
3	9 3/8	44.00	5 1/8	44.00

FAIRBANKS BRONZE REGRINDING VALVES

Fig. 3535

CROSS TYPE

HEAVY AND EXTRA HEAVY PATTERN

For 200 and 300 Pounds Working Pressure.

SCREW END

Size, Inches	Heavy — 200 Pounds Pressure End to End, Inches	Heavy — Each	Extra Heavy — 300 Pounds Pressure End to End, Inches	Extra Heavy — Each
3/8	2	$1.00	2 3/8	$1.30
1/2	2 3/8	1.50	2 9/16	1.90
3/4	2 3/4	2.00	3 1/8	2.90
1	3 1/4	2.70	3 5/8	4.50
1 1/4	3 3/4	3.50	4 3/16	6.30
1 1/2	4 1/4	5.10	4 3/4	8.60
2	5 1/8	8.00	5 9/16	13.10
2 1/2	6 5/8	16.00	7 3/8	23.40
3	7 1/2	24.00	8 1/4	34.50

FAIRBANKS "HITENSIL" VALVES REGRINDING AND RENEWABLE SEAT AND DISC

Iron Body Bronze Mounted. Screw Ends. For Working Pressure up to 150 Pounds.

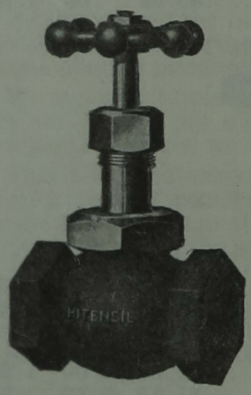


Fig. 3536

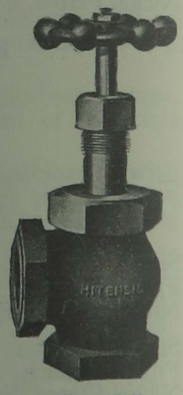


Fig. 3537

SCREW END

The body of this valve is made of special iron, having a tensile strength of 30,000 pounds.

The renewable seat ring and disc are of special nickel composition.

Size, Inches	Globe Type — End to End, Inches	Globe Type — Each	Angle Type — Center to End, Inches	Angle Type — Each
1/2	2 7/8	$1.60	1 3/8	$1.60
3/4	3 13/32	2.20	1 21/32	2.20
1	3 15/32	2.80	1 7/8	2.80
1 1/4	4 1/2	4.00	2 3/16	4.00
1 1/2	5 1/16	5.50	2 7/16	5.50
2	6 1/16	8.75	2 7/8	8.75

A complete valve catalogue showing and describing our complete line of valves and fittings will be sent on request.

FAIRBANKS RENEWABLE REGRINDING BRONZE VALVES

GLOBE AND ANGLE TYPES

Renewable Seat Rings and Discs of Bronze or Nickel—Extra Heavy Pattern

FOR WORKING PRESSURES UP TO 300 POUNDS

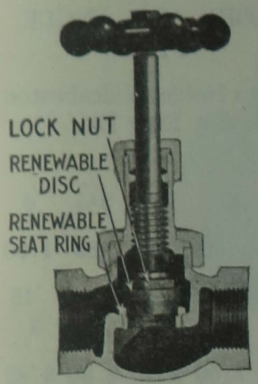


Fig. 3538

This valve embodies all good points of the Fairbanks regrinding valve and in addition has the important feature of repairability. Both the seat ring and the disc may be repaired or renewed, thereby making the valve good as new again at small cost, and without removing the body from the pipe line.

The renewable disc is quickly screwed on and off the threaded lock nut, and the ring is just as readily screwed in and out of the valve body.

For saturated steam, both disc and seat ring are made of steam bronze, nickel being used for superheated steam.

GLOBE OR ANGLE TYPES—SCREW END

Size, Inches	¼	⅜	½
Bronze Seat and Disc, Each	$0.90	1.10	1.50
Nickel Seat and Disc, Each	$0.90	1.10	1.50
Size, Inches	¾	1	1¼
Bronze Seat and Disc, Each	$2.30	3.60	5.10
Nickle Seat and Disc, Each	$2.30	3.60	5.10
Size, Inches	1½	2	2½	3
Bronze Seat and Disc, Each	$7.10	10.90	19.50	29.00
Nickel Seat and Disc, Each	$7.10	10.90	19.50	29.00

FAIRBANKS STANDARD BRONZE VALVE PARTS

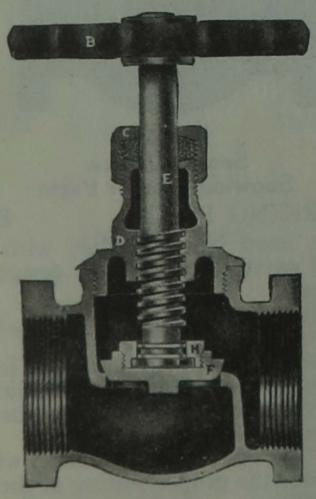


Fig. 3539

B—Wheel
C—Packing Nut
D—Bonnet
E—Spindle
F—Disc
G—Body
H—Disc Lock Nut

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

FAIRBANKS STANDARD BRONZE VALVES

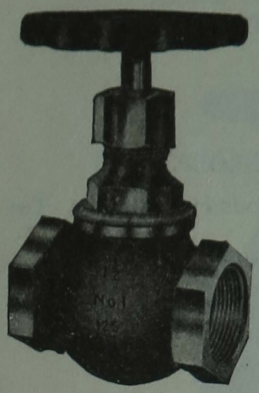


Fig. 3540
Globe Type

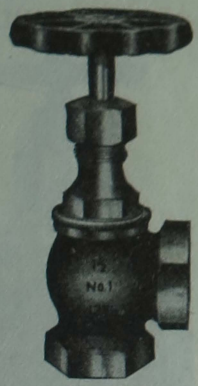


Fig. 3541
Angle Type

SCREW END FOR STEAM WORKING PRESSURES UP TO 125 POUNDS

Fairbanks Standard Valves are made of high-grade steam bronze; are well proportioned, accurately machined and of good weight.

Every valve is subjected to careful inspection and to hydraulic test.

Size, Inches	Globe Type End to End, Inches	Globe Type Each	Angle Type Center to End, Inches	Angle Type Each
¼	1 13/16	$0.72	2 9/32	$0.72
⅜	2	.77	1	.77
½	2 1/8	1.00	1 1/16	1.00
¾	2 5/8	1.26	1 5/16	1.26
1	3 3/16	1.80	1 19/32	1.80
1¼	3 5/8	2.52	1 13/16	2.52
1½	4 1/16	3.50	2 1/32	3.50
2	5 1/16	5.30	2 17/32	5.30

FAIRBANKS VULCABESTON IRON BODY VALVES—GLOBE AND ANGLE TYPES

RENEWABLE VULCABESTON RING DISC

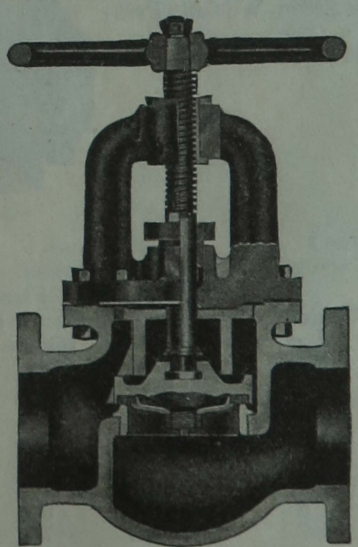


Fig. 3542

TO RENEW: Simply unbolt and remove the bonnet of the valve, remove the old vulcabeston disc ring from the holder and substitute a new one.

FAIRBANKS VULCABESTON IRON BODY VALVES

RENEWABLE VULCABESTON RING DISC

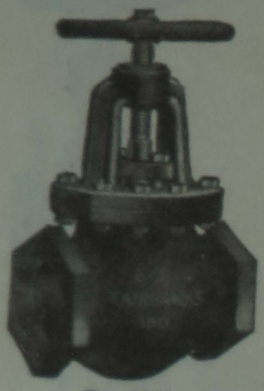


Fig. 3543

GLOBE TYPE

350 Pounds Hydraulic Test Pressure.

150 Pounds Steam Working Pressure.

175 Pounds Water Working Pressure.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6¾	$10.00	6½	$11.75
2½	7⅞	12.00	8	14.00
3	9	16.75	9	18.50
3½	10	19.50	10⅛	21.50
4	10⅜	24.00	10¾	26.00
4½	11¾	32.00	11⅜	34.00
5	12	40.00	12	42.00
6	14	48.00	15½	50.00
7	15	80.00	15⅝	80.00
8	17¼	90.00	17	90.00

ANGLE TYPE

350 Pounds Hydraulic Test Pressure.

150 Pounds Steam Working Pressure.

175 Pounds Water Working Pressure.

Fig. 3544

Size, Inches	Screw End Center to End, Inches	Each	Flange End Center to Face, Inches	Each
2	3⅜	$10.00	4⅛	$11.75
2½	4¼	12.00	4⅝	14.00
3	4⅝	16.75	5	18.50
3½	4⅞	19.50	5½	21.50
4	5¼	24.00	6	26.00
4½	5¾	32.00	6¼	34.00
5	6	40.00	6½	42.00
6	7	48.00	7⅜	50.00
7	7⅞	80.00	7⅞	80.00
8	8⅞	90.00	8½	90.00

Made in Bronze at Special Prices

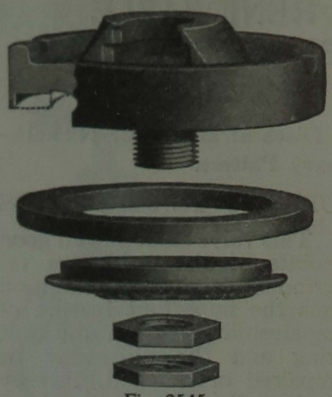


Fig. 3545

FAIRBANKS VULCABESTON IRON BODY VALVES

RENEWABLE DISCS

GLOBE AND ANGLE TYPES

Iron Holder Vulcabeston or Bronze Ring Disc.

Size, Inches	2	2½	3	3½	4
Holder, with Disc Complete, Each	$0.40	.50	.65	.85	1.00
Disc Rings, Vulcabeston or Bronze, Each	$0.16	.22	.26	.37	.45
Size, Inches	4½	5	6	7	8
Holders with Disc Complete, Each	$1.30	1.50	2.00	2.90	3.30
Disc Rings, Vulcabeston or Bronze, Each	$0.53	.58	.78	.95	1.10

FAIRBANKS HEAVY AND EXTRA HEAVY IRON BODY VALVES

GLOBE AND ANGLE TYPES

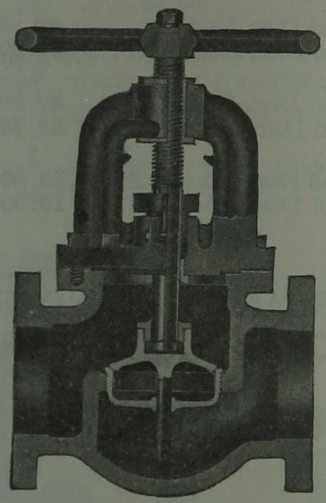


Fig. 3546

Sectional View Showing Interior Parts

BRONZE WORKING PARTS BEVEL DISC

These valves have heavy bodies with extra heavy bronze seat and swivel disc, and are designed with large and free openings.

Furnished with steel spindles in all sizes. Bronze spindles, prices on application.

The swivel disc is made with a guide. In valves up to and including 3½ inches the discs are of solid bronze, extra heavy. In valves 4 inches and larger they are of cast iron, with bronze facing.

The guide on the disc, in combination with the bridge on the seat, insures the proper seating of the disc and prevents it from rattling.

These valves can be packed under pressure, when wide open.

Stuffing box is cast solid with yoke, with follower of malleable iron, bronze bushed.

Our heavy and extra heavy valves are furnished with 1/32-inch raised faces on the end flanges, for which no extra charge is made.

For dimensions and prices see the next page

FAIRBANKS IRON BODY VALVES

HEAVY PATTERN
GLOBE AND ANGLE TYPES

Fig. 3547

Flange End

Heavy Pattern
Bronze Working Parts, Bevel Disc

500 Pounds Hydraulic Test Pressure.
200 Pounds Steam Working Pressure.
250 Pounds Water Working Pressure.

GLOBE TYPE

Size, Inches	Screw End End to End, Inches	Screw End End to End, Each	Flange End Face to Face, Inches	Flange End Face to Face, Each
2	8¾	$13.00	9	$15.00
2½	9½	16.00	10	18.00
3	10⅜	20.00	11	23.00
3½	11⅛	24.00	12	28.00
4	12	28.00	13	33.00
4½	12⅞	35.00	13½	40.00
5	13⅝	42.00	14½	47.00
6	15¼	50.00	16	55.00
7	16⅞	80.00	17½	85.00
8	18½	90.00	20	95.00
10	21¾	.....	22½	145.00
12	25	.....	25½	200.00

ANGLE TYPE

Size, Inches	Screw End Center to End, Inches	Screw End Center to End, Each	Flange End Center to Face, Inches	Flange End Center to Face, Each
2	4⅜	$13.00	4½	$15.00
2½	4¾	16.00	5	18.00
3	5⅜16	20.00	5½	23.00
3½	5⅝16	24.00	6	28.00
4	6	28.00	6½	33.00
4½	6⅞16	35.00	6¾	40.00
5	6¹³⁄₁₆	42.00	7¼	47.00
6	7⅝	50.00	8	55.00
7	8⅞16	80.00	8¾	85.00
8	9¼	90.00	10	95.00
10	10⅞	.....	11¼	145.00
12	12½	.....	12¾	200.00

A catalogue showing our complete line of valves and fittings will be sent on request.

FAIRBANKS IRON BODY VALVES

EXTRA HEAVY PATTERN
GLOBE AND ANGLE TYPES

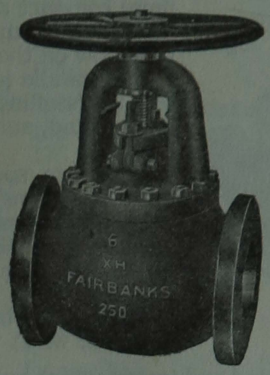


Fig. 3548

Flange End

Bronze Working Parts, Bevel Disc

800 Pounds Hydraulic Test Pressure.
250 Pounds Steam Working Pressure.
350 Pounds Water Working Pressure.

GLOBE TYPE

Size, Inches	Screw End End to End, Inches	Screw End End to End, Each	Flange End Face to Face, Inches	Flange End Face to Face, Each
2	9½	$26.00	10½	$27.50
2½	10¾	33.00	11½	35.00
3	11¾	37.00	12½	40.00
3½	12¼	42.00	13¼	45.00
4	13	46.00	14	50.00
4½	14	56.00	15	60.00
5	15	61.00	15¾	65.00
6	16½	75.00	17½	80.00
7	18¼	95.00	19¼	100.00
8	20	114.00	21	120.00
10	23¼	.....	24½	200.00
12	27	.....	28	300.00

ANGLE TYPE

Size, Inches	Screw End Center to End, Inches	Screw End Center to End, Each	Flange End Center to Face, Inches	Flange End Center to Face, Each
2	4¾	$26.00	5¼	$27.50
2½	5⅜8	33.00	5¾	35.00
3	5⅞	37.00	6¼	40.00
3½	6⅛	42.00	6⅝	45.00
4	6½	46.00	7	50.00
4½	7	56.00	7½	60.00
5	7½	61.00	7⅞	65.00
6	8¼	75.00	8¾	80.00
7	9⅛	95.00	9⅝	100.00
8	10	114.00	10½	120.00
10	11⅝	.....	12¼	200.00
12	13½	.....	14	300.00

A catalogue showing our complete line of valves and fittings will be sent on request.

FAIRBANKS IRON BODY VALVES

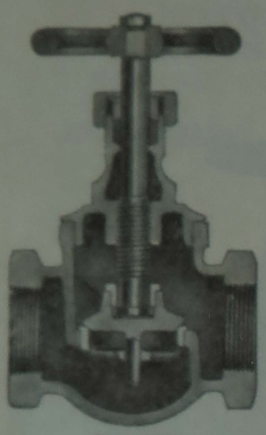


Fig. 3549

Bronze Hub and Bronze Working Parts. Bevel Disc.

Fairbanks Iron Body Bronze Hub Globe, Angle and Cross Valves, of design shown, are more compact and heavier than many other makes of similar type now on the market.

The spindle is of large diameter, the stuffing box has a follower gland, and the disc seat is heavy.

They are specially desirable for traction engine use, throttle valves and steam stops in any service; and they are recommended when quality is the first consideration.

They may be packed under pressure, when wide open.

Carefully inspected and tested under hydraulic pressure.

GLOBE TYPE

350 Pounds Hydraulic Pressure.

150 Pounds Steam Working Pressure.

175 Pounds Water Working Pressure.

Size, Inches	Screw End End to End, Inches	Each
1¼	4½	$4.00
1½	5⅛	5.00
2	6	7.25
2½	7⅛	11.00
3	7⅝	16.00

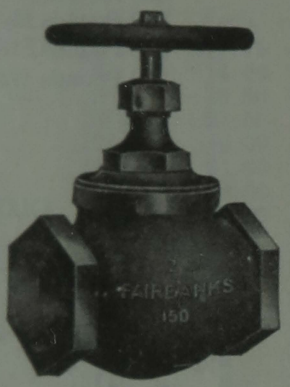


Fig. 3550

Fig. 3551

ANGLE TYPE

350 Pounds Hydraulic Pressure.

150 Pounds Steam Working Pressure.

175 Pounds Water Working Pressure.

Size, Inches	Screw End Center to End Inches	Each
1¼	2⅜16	$4.00
1½	2½	5.00
2	3	7.25
2½	3⅜16	11.00
3	4	16.00

DETAIL DIMENSIONS

Size, Inches		1¼	1½	2	2½	3
Diameter of Spindle		33/64	35/64	41/64	23/32	23/32
Diameter of Handwheel		3⅞	4 7/16	4¾	6½	7½
Center of Port to Top of Handwheel	Globe Closed	5 5/16	6⅛	7	8 5/16	9⅞
	Globe Open	5 15/16	6⅞	7 15/16	9 9/16	11 5/8
	Angle Closed	5⅞	6⅞	7⅝	8 13/16	10⅛
	Angle Open	7	8⅜	8 13/16	10⅜	12 1/16
Center to Bottom, Angle, Screw End		2 5/16	2⅝	3 3/16	3 15/16	4 9/16

FAIRBANKS IRON BODY VALVES

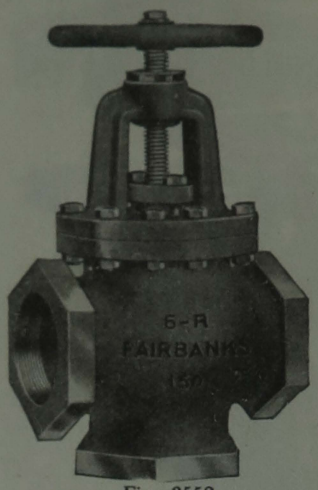


Fig. 3552

CROSS TYPE RENEWABLE VULCABESTON RING DISC

350 Pounds Hydraulic Test Pressure.

150 Pounds Steam Working Pressure.

175 Pounds Water Working Pressure.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6¾	$14.00	6½	$17.00
2½	7⅞	16.00	8	19.00
3	9	21.00	9	24.00
3½	10	26.00	10⅛	29.00
4	10⅜	30.00	10¾	33.00
4½	11¾	42.00	11⅜	45.00
5	12	45.00	12	48.00
6	14	58.00	15½	62.00

FAIRBANKS METAL DISC IRON BODY VALVES

GLOBE AND ANGLE TYPES

BRONZE WORKING PARTS—BEVEL DISC

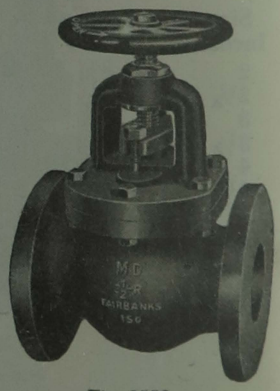


Fig. 3553

350 Pounds Hydraulic Test Pressure. 150 Pounds Steam Working Pressure. 175 Pounds Water Working pressure.

The Iron Body Metal Disc Valves are constructed along practical lines which embody the renewability of the working parts, including the seat ring or disc.

The discs of these valves are of solid bronze up to and including the 3½-inch size. Larger sizes are made with the cast iron disc with bronze facing.

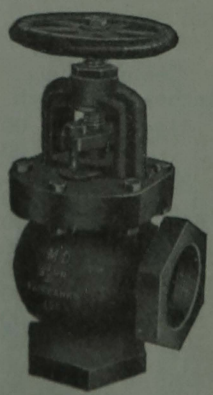


Fig. 3554

A bridge, with an accurately machined hole in the center, is cast across the bottom of the seat. This guides the disc stem at the bottom of the disc, insuring a tight joint when the valve is being closed, also preventing rattling and tilting when valve is opened.

This valve can be packed under pressure when wide open.

The spindles are made of the best cast bronze composition. Valves can be furnished with spindles, screwed-in seat ring and metal disc of special compositions, if desired.

These valves are also made in CROSS TYPE.

Prices on Application

FAIRBANKS BRONZE VALVES

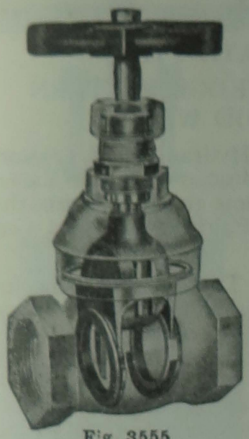


Fig. 3555

GATE TYPE

Solid Wedge Pattern; Renewable Bronze Seat Rings; Cage Construction. Patented.

The renewable features of these valves have been perfected, are simple and may be relied upon as being entirely effective.

Renewals may be easily, quickly and efficiently made when occasion requires, without taking the valve from the pipe line by removing the valve hub and unscrewing the retaining ring designed to hold the seat rings accurately and firmly in position.

These valves are double seated and may be used with the pressure applied at either end.

PARTS

A—Wheel Stem Nut
B—Wheel
C—Stuffing Box
D—Stuffing Box Packing Nut
E—Bonnet
F—Cage or Saddle
G—Spindle
H—Wedge
I—Seat Rings
J—Body
N—Follower Gland
O—Cage Locking Ring

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valves.

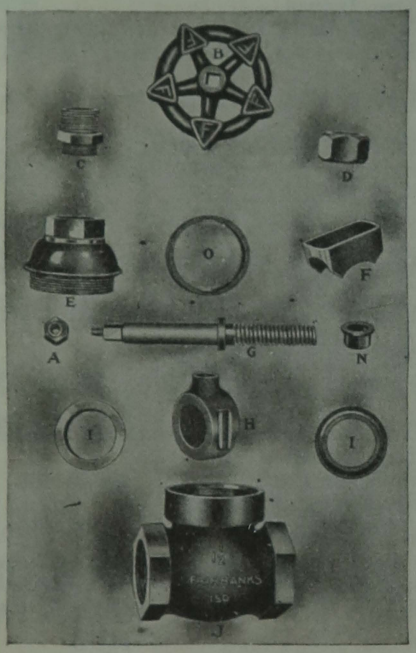


Fig. 3556

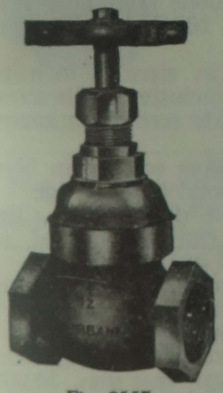


Fig. 3557

STATIONARY SPINDLE

300 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.

Size, Inches	Screw End, End to End, Inches	Each	Flange End, Face to Face, Inches	Each
1/2	2 1/2	$1.65	3 1/4	....
3/4	2 15/16	2.20	3 11/16	....
1	3 3/8	2.80	4 1/4	$7.50
1 1/4	3 13/16	4.00	4 3/4	9.35
1 1/2	4 1/4	5.30	5 1/16	14.00
2	5 1/8	7.80	6	16.00
2 1/2	5 3/4	17.00	6 13/16	26.50
3	6 1/2	23.00	8 1/8	35.75

FAIRBANKS BRONZE VALVES

Fig. 3558

GATE TYPE

RISING SPINDLE

Solid Wedge Pattern, Renewable Bronze Seat Rings. Cage Construction.

300 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.

Size, Inches	Screw End, End to End, Inches	Each	Flange End, Face to Face, Inches	Each
1/2	2 1/2	$4.25	3 1/4	....
3/4	2 15/16	5.00	3 11/16	....
1	3 3/8	5.80	4 1/4	$10.50
1 1/4	3 13/16	7.50	4 3/4	13.00
1 1/2	4 1/4	9.00	5 1/16	17.75
2	5 1/8	12.50	6	20.50

SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure. 125 Pounds Steam Working Pressure. 150 Pounds Water Working Pressure.

Size, Inches	Screw End, End to End, Inches	Each
1/4	1 11/16	$1.45
3/8	1 11/16	1.45
1/2	2	1.65
3/4	2 1/4	2.05
1	2 5/8	2.80
1 1/4	3	3.70
1 1/2	3 1/2	5.00
2	4	7.30
2 1/2	4 1/2	13.00
3	5	19.00

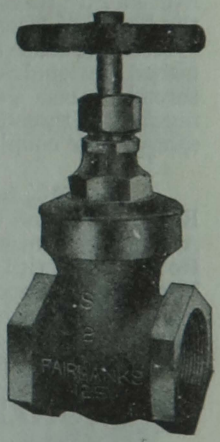


Fig. 3559

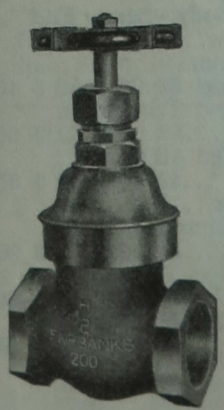


Fig. 3560

SOLID WEDGE PATTERN HEAVY—WITH GLAND

450 Pounds Hydraulic Test Pressure. 200 Pounds Steam Working Pressure. 250 Pounds Water Working Pressure.

Size, Inches	Screw End, End to End, Inches	Each
1/4	....	$2.35
3/8	2 1/8	2.35
1/2	2 11/16	2.75
3/4	3 3/16	3.25
1	3 19/32	4.50
1 1/4	4 1/16	6.00
1 1/2	4 1/2	8.00
2	5 3/8	13.00

A catalogue showing our complete line of valves and fittings will be sent on request.

FAIRBANKS BRONZE VALVES

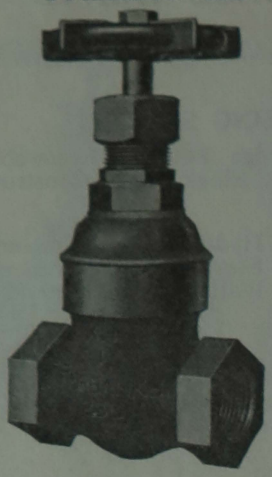


Fig. 3561

GATE TYPE

EXTRA HEAVY WITH GLAND—SOLID WEDGE PATTERN

800 Pounds Hydraulic Test Pressure. 250 Pounds Steam Working Pressure. 350 Pounds Water Working Pressure.

Size, Inches	Screw End, End to End, Inches	Each
½	2 13/16	$5.00
¾	3 7/16	6.00
1	4	8.00
1¼	4 5/8	11.25
1½	5¼	16.50
2	6⅛	23.00

BRONZE HOSE END VALVES

GATE TYPE

SCREW INLET
HOSE THREAD OUTLET

Suitable for Water Pressures up to 150 Pounds.

Furnished with or without cap and chain.

Approved by Associated Factories Mutual Fire Insurance Company and the National Board of Underwriters.

Hose threads are regularly furnished National Standard. For other threads, please specify diameter and number of threads per inch, or send sample hose coupling.

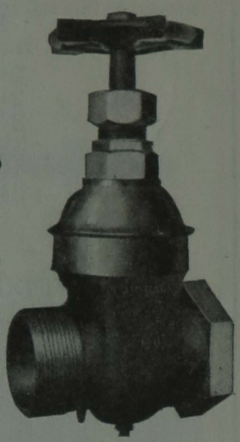


Fig. 3562

Size, 2½ Inches	Each
Rough Body and Iron Wheel	$15.00
Above with Finished Bronze Cap and Chain	$20.00
Rough Body with Finished Bronze Wheel	$18.70
Finished Body and Finished Bronze Wheel	$26.00
Above with Finished Bronze Cap and Chain	$31.00
Finished Body, Bronze Wheel, Nickel Plated All Over	$27.25
Above with Finished Bronze Cap and Chain	$32.25

BRONZE RADIATOR VALVES

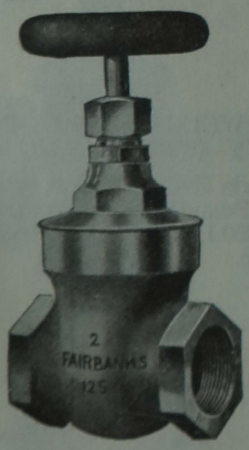


Fig. 3563

GATE TYPE–SOLID WEDGE PATTERN–WOOD WHEEL

300 Pounds Hydraulic Test Pressure.

Rough Body—Screw End

Size, Inches	½	¾	1
Finished Trimmings, Each	$2.00	2.55	3.40
Nickel Plated Trimmings, Each	$2.20	2.80	3.65
Nickel Plated All Over Each	$2.40	3.00	3.85
Size, Inches	1¼	1½	2
Finished Trimmings, Each	$4.50	6.00	8.90
Nickel Plated Trimmings, Each	$4.75	6.25	9.30
Nickel Plated All Over Each	$5.00	6.60	9.65

Finished Body

Size, Inches	½	¾	1
Finished All Over, Each	$3.30	4.00	5.10
Above, Nickel Plated, Each	$3.70	4.50	5.60
Size, Inches	1¼	1½	2
Finished All Over, Each	$6.75	9.00	13.90
Above, Nickel Plated, Each	$7.35	9.70	14.86

FAIRBANKS BRONZE RADIATOR VALVES

Fig. 3564

GATE TYPE

SOLID WEDGE PATTERN
WOOD WHEEL

300 Pounds Hydraulic Test Tressure. Fairbanks Bronze Radiator Valves. Embody the same general features that are found in Fairbanks Bronze Gate Valves.

The valves can be furnished in various styles of finish with Iron, Bronze or Wood Wheels, also with Lockshields and Keys. They are regularly furnished with Black Wood Wheels.

Male Union End

Size, Inches	¾	¾	1
Rough Body, Finished Trimmings, Each	$3.20	3.75	4.65
Rough Body, Nickel Plated Trimmings, Each	$3.40	4.00	4.90
Rough Body, Nickel Plated All Over, Each	$3.65	4.25	5.20
Finished All Over, Each	$4.45	5.25	6.35
Finished All Over and Nickel Plated, Each	$4.90	5.75	7.00
Size, Inches	1¼	1½	2
Rough Body, Finished Trimmings, Each	$6.00	8.25	11.90
Rough Body, Nickel Plated Trimmings, Each	$6.30	8.65	12.30
Rough Body, Nickel Plated All Over, Each	$6.60	9.00	12.80
Finished All Over, Each	$8.25	11.25	16.90
Finished All Over and Nickel Plated, Each	$9.00	12.00	17.90

Extra for Lockshields, Add to the Lists of Wood Wheel Valves

Size, Inches	½	¾	1	1¼	1½	2
Finished, Each	$0.55	.60	.70	.85	1.00	1.45
Finished and Nickel Plated, Each	$0.65	.70	.85	1.00	1.20	1.70

FAIRBANKS ALL IRON VALVES

GATE TYPE SOLID WEDGE PATTERN—SCREW HUB

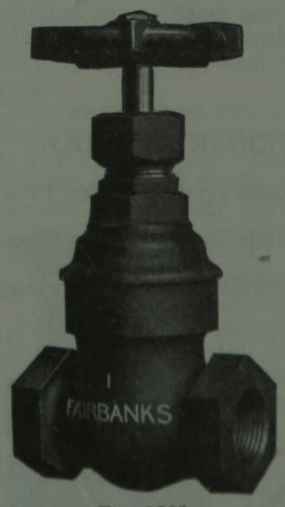


Fig. 3565

300 Pounds Hydraulic Test Pressure. 100 Pounds Working pressure.

Made in sizes ½ inch to 2 inches inclusive, with screw ends, inside screw, stationary spindle.

They have screwed-in bonnet and solid taper wedge.

Being a double gate, the pressure can be applied to either end of the valve.

The neck ring packing is "Fairbanks-Vulcabeston" specially molded.

They are made of high tensile strength cast iron, 30,000 pounds per inch; with steel spindle.

These valves are recommended for acids, gases, creosote, etc., in fact for any liquids or gases for which an all-iron valve is to be used.

Size, Inches	½	¾	1
End to End, Inches	2 7/8	3 1/16	4 1/16
Fig. 3565, Screw End, Each	$2.00	2.35	2.05
Size, Inches	1¼	1½	2
End to End, Inches	4 11/16	5 3/16	6 3/16
Fig. 3565 Screw End, Each	$3.50	5.00	7.50

FAIRBANKS RENEWABLE IRON BODY VALVES

GATE TYPE

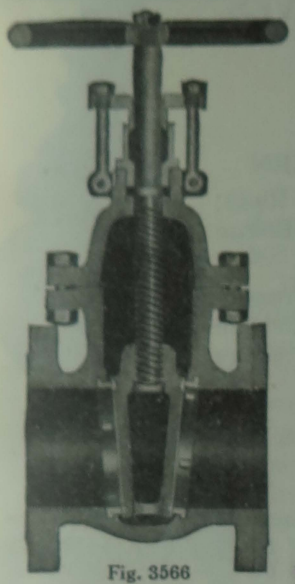


Fig. 3566

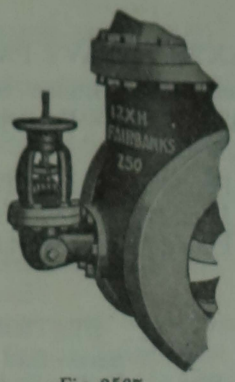


Fig. 3567

Fig. 3568

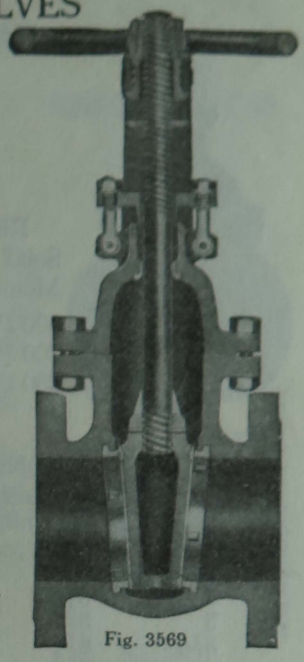


Fig. 3569

RENEWABLE BRONZE SEAT RINGS
BRONZE MOUNTED SOLID WEDGE PATTERN
STATIONARY OR RISING SPINDLE

These valves have been designed with strength adequate to resist pipe strains developed at the maximum steam pressures for which they are recommended.

Renewable seat rings, made of high-grade bronze, are held in the body casting by specially constructed cut threads, and may be changed by the use of an appropriate wrench or other tool without removing the valve from the pipe line.

The seat rings engage with the accurately finished steam bronze faces of a double taper solid wedge, making tight joints, and the pressure may be applied to either end of the valve.

The hinge bolts of the stuffing box and the shelf on the yoke of the rising spindle valve, for holding the gland during the process of packing the stuffing box, are features which engineers will appreciate.

The gate by-pass is similar in design and is secured to the body of the main valve by one joint only.

These valves are made with rising or stationary spindles; with all parts interchangeable; and the stuffing box may be packed under pressure.

The heavy and extra heavy valves are made with $\frac{1}{32}$-inch raised faces on the end flanges without extra charge.

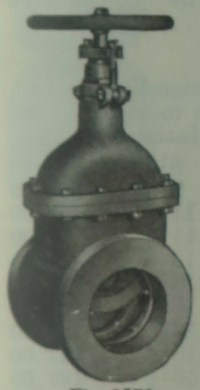


Fig. 3570

GLOBE BY-PASS

We are prepared to furnish a Globe By-Pass as illustrated. The body of this By-Pass is an integral part of the main valve body. The disc, spindle, hub, packing nut and follower are of steam bronze. This style of By-Pass is generally used on valves 4½ inches and smaller.

350 Pounds Hydraulic Test Pressure
150 Pounds Steam Working Pressure
175 Pounds Water Working Pressure

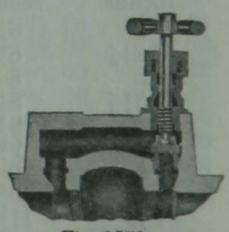


Fig. 3571

Size, Inches	Stationary Spindle				Rising Spindle			
	Screw End		Flange End		Screw End		Flange End	
	End to End, Inches	Each	Face to Face, Inches	Each	Steel Stem, Each	Bronze Stem, Each	Steel Stem, Each	Bronze Stem, Each
2	5¾	$10.00	6½	$12.00	$17.50	$19.00	$19.50	$21.00
2½	6	11.50	7⅞	13.50	19.00	20.50	21.00	22.50
3	7½	14.00	8¼	16.50	22.00	23.50	24.50	26.00
3½	8	17.00	9	19.50	25.00	27.00	27.50	29.50
4	8⅞	19.00	9½	23.00	30.00	32.50	34.00	36.50
4½	9	24.00	9¾	28.00	37.00	40.00	41.00	44.00
5	9¼	27.50	10½	31.50	42.00	45.00	46.00	49.00
6	9½	32.50	10⅞	36.50	48.00	52.00	52.00	56.00
7	10¾	45.00	11	49.00	64.00	69.00	68.00	73.00
8	11¼	54.00	11½	58.00	80.00	86.00	84.00	90.00
9	12½	76.00	12	81.00	105.00	113.00	110.00	118.00
10	13¼	90.00	12½	95.00	122.00	131.00	127.00	136.00
12	14½	125.00	14	133.00	160.00	172.00	168.00	180.00
14	.....	.....	16	181.00	.....	.....	236.00	255.00
16	.....	.....	17½	260.00	.....	.....	325.00	350.00

Bronze Spindles in O. S. & Y. Gates will be furnished on all orders unless otherwise stated.
Rising Spindle, Sizes 6 inches and smaller, have Yoke Integral with Bonnet.

FAIRBANKS RENEWABLE IRON BODY VALVES

GATE TYPE

STATIONARY OR RISING SPINDLE

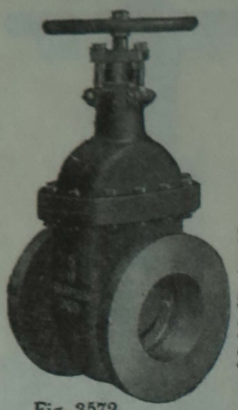


Fig. 3572

HEAVY PATTERN

Renewable Bronze Seat Rings; Solid Wedge Pattern; Bronze Mounted.

500 Pounds Hydraulic Test Pressure
200 Pounds Steam Working Pressure
250 Pounds Water Working Pressure

STATIONARY SPINDLE

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6½	$15.00	7½	$17.50
2½	6¾	17.00	8	19.50
3	8	20.00	9½	23.00
3½	8½	25.00	10	28.00
4	9½	28.00	10½	33.00
4½	9¾	35.00	11	40.00
5	10	40.00	11½	45.00
6	10½	50.00	12	57.00
7	11⅜	75.00	12½	82.00
8	12¼	87.00	13½	94.00
9	13	120.00	14	127.00
10	14	145.00	15	153.00
12	16	185.00	16	195.00
14	....	.....	18	300.00
16	....	.....	19½	400.00
18	....	.....	21	.....

RISING SPINDLE

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6½	$23.00	7½	$25.50
2½	6¾	25.00	8	27.50
3	8	29.00	9½	32.00
3½	8½	35.00	10	38.00
4	9½	40.00	10½	45.00
4½	9¾	50.00	11	55.00
5	10	54.00	11½	59.00
6	10½	65.00	12	72.00
7	11⅜	90.00	12½	97.00
8	12¼	110.00	13½	117.00
9	13	145.00	14	152.00
10	14	170.00	15	178.00
12	16	215.00	16	225.00
14	....	.....	18	340.00
16	....	.....	19½	450.00
18	....	.....	21	600.00

Fig. 3573

EXTRA HEAVY PATTERN

Renewable Bronze Seat Rings; Solid Wedge Pattern; Bronze Mounted.

800 Pounds Hydraulic Test Pressure
250 Pounds Steam Working Pressure
350 Pounds Water Working Pressure

STATIONARY SPINDLE

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6¾	$27.50	8½	$30.00
2½	8	33.00	9½	35.50
3	8½	45.00	11⅛	48.00
3½	9	57.00	11⅞	60.00
4	9½	60.00	12	65.00
4½	10	77.00	13¼	82.00
5	11	85.00	15	90.00
6	11¼	100.00	15⅞	107.00
7	12⅝	125.00	16¼	132.00
8	13¼	155.00	16½	162.00
9	14	225.00	17	232.00
10	15	250.00	18	258.00
12	17½	.....	19¾	335.00
14	....	.....	22½	440.00
16	....	.....	24	675.00
18	....	.....	....	.....

RISING SPINDLE

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6¾	$35.50	8½	$38.00
2½	8	41.00	9½	43.50
3	8½	54.00	11⅛	57.00
3½	9	67.00	11⅞	70.00
4	9½	72.00	12	77.00
4½	10	92.00	13¼	97.00
5	11	100.00	15	105.00
6	11¼	115.00	15⅞	122.00
7	12⅝	140.00	16¼	147.00
8	13¼	180.00	16½	187.00
9	14	250.00	17	257.00
10	15	275.00	18	283.00
12	17½	.....	19¾	390.00
14	....	.....	22½	510.00
16	....	.....	24	750.00
18	....	.....	....	.....

Rising Spindle, 6 inches and smaller, have yoke integral with bonnet.

Bronze Spindles to 4½ inches inclusive, Steel Spindles 5 inches and above, in stationary Spindle Type. Steel Spindles in Outside Spindle and Yoke Type. Bronze Spindles in Outside Spindle and Yoke Type at Special Prices.

EXTRA SEAT RINGS AND WRENCHES

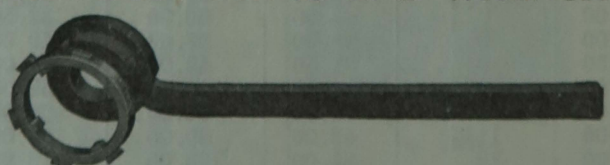


Fig. 3574
Seat Ring

Fig. 3575
Ring Wrench

Size, Inches	2	2½	3	3½	4	4½	5	6	7	8	9	10	12	14	16	18	20	24
Seat Ring, Each	$0.40	.60	.80	1.00	1.20	1.40	1.60	2.00	2.30	3.10	3.70	4.20	5.80	7.50	11.00	18.00	26.00	36.00
Wrench, Each	$1.00	1.70	1.80	1.80	2.00	2.20	2.50	3.00	3.50	3.50	4.00	4.00	5.00	6.00	7.00	7.00	9.50	10.50

FAIRBANKS STANDARD IRON BODY VALVES

GATE TYPE

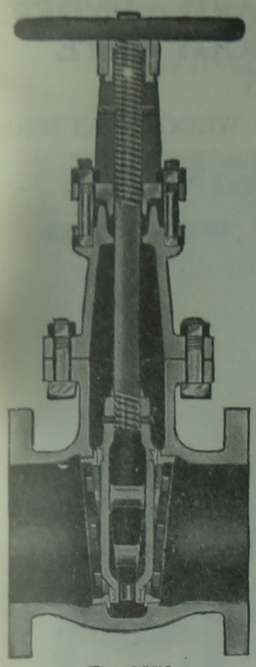


Fig. 3576

BRONZE MOUNTED SOLID WEDGE PATTERN

These Standard Iron Body Gate Valves, Solid Wedge Pattern, are designed for a steam working pressure of 125 pounds, and are tested to 300 pounds hydraulic pressure, with the valve closed.

The guides in the wedge and the ribs in the body are so finished and fitted as to insure true and easy movement and to prevent the wedge from touching seats in the body, except at point of closing.

The seats in the body and the faces of the wedge are made of high-grade bronze.

All Inside Screw Valves have Bronze Stems. Our Standard Stock Valve of Outside Spindle and Yoke type is made with a stem of Rolled Navy Bronze, this being more suitable for general purposes than steel. We furnish the Outside Spindle and Yoke type of valve with steel stem on special orders only.

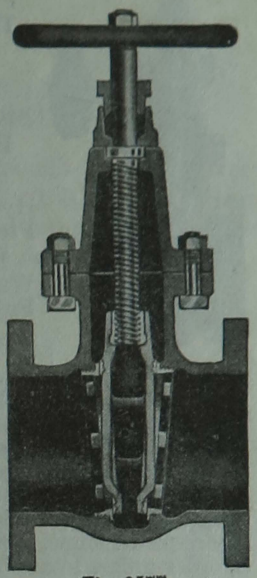


Fig. 3577

SCREW END—SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure.
125 Pounds Steam Working Pressure.
150 Pounds Water Working Pressure.

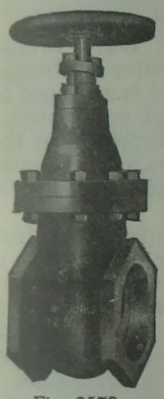


Fig. 3578

Size, Inches	Screw End, End to End, Inches	Each
2	5 7/16	$10.00
2½	5 7/8	11.50
3	6 1/8	14.00
3½	6 1/2	17.00
4	6 7/8	19.00
4½	7 1/4	24.00
5	7 5/16	27.50
6	7 3/4	32.50
7	8 1/4	45.00
8	8 11/16	54.00
9	.....	76.00
10	9 7/8	90.00
12	11 5/8	125.00

FLANGE END — SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure. 125 Pounds Steam Working Pressure. 150 Pounds Water Working Pressure.

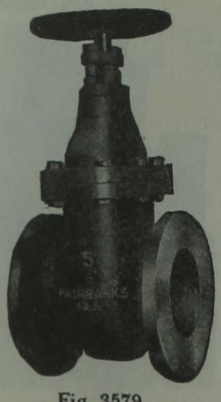


Fig. 3579

Size, Inches	Face to Face, Inches	Each
2	7	$12.00
2½	7½	13.50
3	8	16.50
3½	8½	19.50
4	9	23.00
4½	9½	28.00
5	10	31.50

Size, Inches	Face to Face, Inches	Each	Size Inches	Face to Face, Inches	Each
6	10½	$36.50	14	.....	$181.00
7	11	49.00	16	.....	260.00
8	11½	58.00	18	.....	350.00
9	12	81.00	20	.....	425.00
10	13	95.00	22	.....	530.00
12	14	133.00	24	.....	600.00

SCREW END—SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure.
125 Pounds Steam Working Pressure.
150 Pounds Water Working Pressure.

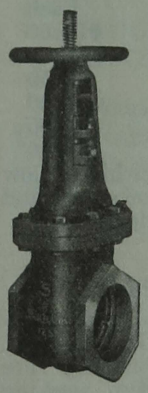


Fig. 3580

Size, Inches	Screw End, End to End, Inches	Steel Stem, Each	Bronze Stem, Each
2	5 7/16	$17.50	$19.00
2½	5 7/8	19.00	20.50
3	6 1/8	22.00	23.50
3½	6 1/2	25.00	27.00
4	6 7/8	30.00	32.50
4½	7 1/4	37.00	40.00
5	7 5/16	42.00	45.00
6	7 3/4	48.00	52.00
7	8 1/4	64.00	69.00
8	8 11/16	80.00	86.00
9	....	105.00	113.00
10	9 7/8	122.00	131.00
12	11 5/8	160.00	172.00

FLANGE END — SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure.
125 Pounds Steam Working Pressure.
150 Pounds Water Working Pressure.

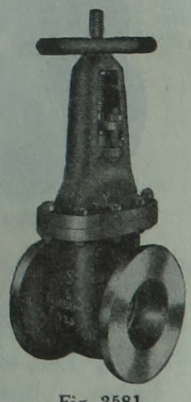
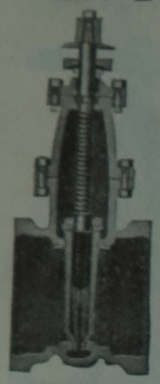


Fig. 3581

Size, Inches	Face to Face, Inches	Steel Stem, Each	Bronze Stem, Each
2	7	$19.50	$21.00
2½	7½	21.00	22.50
3	8	24.50	26.00
3½	8½	27.50	29.50
4	9	34.00	36.50
4½	9½	41.00	44.00
5	10	46.00	49.00

Size, Inches	Face to Face, Inches	Steel Stem, Each	Bronze Stem, Each	Size, Inches	Steel Stem, Each	Bronze Stem, Each
6	10½	$52.00	$56.00	14	$236.00	$255.00
7	11	68.00	73.00	16	325.00	350.00
8	11½	84.00	90.00	18	435.00	470.00
9	12	110.00	118.00	20	525.00	565.00
10	13	127.00	136.00	22	650.00	700.00
12	14	168.00	180.00	24	725.00	775.00

FAIRBANKS STANDARD IRON BODY VALVES—GATE TYPE



TAPER SEAT
BRONZE
MOUNTED
DOUBLE WEDGE
BELL ENDS

300 Pounds Hydraulic Test Pressure.

150 Pounds Water Working Pressure.

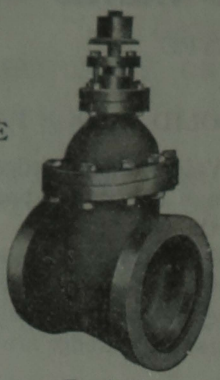


Fig. 3582

Fig. 3583

These Iron Body Bell End Gate Valves are tested to 300 pounds hydraulic pressure when closed.

The seats in the body and the faces of the wedge are made of high-grade bronze.

The double taper wedges are so guided that they cannot scrape against the valve seats. They align themselves to any required angle, are easily operated and cannot get out of order unless from abuse.

The design of the wedge and disc stem nut is such as to insure equal pressure over the entire area of the contact rings.

Size, Inches	Face to Face, Inches	Depth of Bell, Inches	Each
3	9¼	2¾	$14.00
4	10 11/16	3½	19.00
6	11¼	3½	32.50
8	13	4	54.00
10	14	4	90.00
12	14½	4	125.00

Bell End and Flange End Valves suitable for high or low pressures and Flange End Valves for exhaust steam and for gas, furnished in sizes 14 to 48 inches inclusive.

Prices on Application

QUICK OPENING GATE TYPE

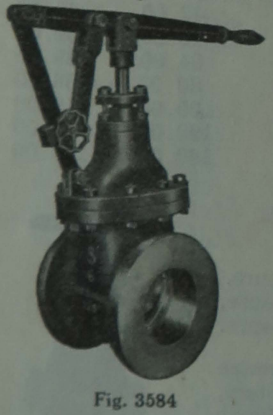


Fig. 3584

These Standard Iron Body Quick-opening Gate Valves, Solid Wedge Pattern, are designed for a steam working pressure of 125 pounds and are tested to 300 pounds hydraulic pressure, with the valve closed.

The guides in the wedge and the ribs in the body are so finished and fitted as to insure true and easy movement, and to prevent the wedge from touching seats in the body, except at point of closing.

The seats in the body and the faces of the wedge are made of high-grade bronze.

The operating and locking device of this Quick-opening Valve is positive in action. It will hold the wedge and spindle in any desired position and cannot be jarred loose.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	5 3/16	$17.50	7	$19.50
2½	5 7/8	19.00	7½	21.00
3	6 1/8	22.00	8	24.50
3½	6½	25.00	8½	27.50
4	6 7/8	30.00	9	34.00
4½	7¼	37.00	9½	41.00
5	7 5/16	42.00	10	46.00
6	7¾	48.00	10½	52.00
7	8¼	64.00	11	68.00
8	8 11/16	80.00	11½	84.00

FAIRBANKS STANDARD UNDERWRITERS IRON BODY GATE VALVES

BRONZE MOUNTED—SOLID WEDGE PATTERN

300 Pounds Hydraulic Test Pressure.
150 Pounds Water Working Pressure.

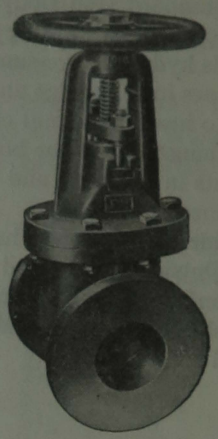


Fig. 3585

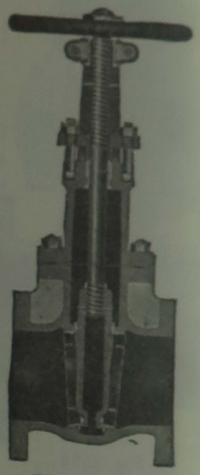


Fig. 3586

Valves up to and including 4 inches, Yoke Cast Solid to Bonnet.

Valves larger than 4 inches, Yoke Bolted to Bonnet.

Fairbanks Standard Underwriters Iron Body Bronze Mounted Outside Spindle and Yoke Gate Valve has bronze stem, bronze trimmings and wedge gate and is arranged to turn to the left to open, as specified by the Underwriters.

This valve is of the accepted pattern as approved by the National Fire Protection Association, and is used on water working pressure of 150 pounds and is tested to a 300 pound hydraulic pressure.

The outside screw and yoke type is the only type of Iron Body Gate Valve which shows at a glance if the valve is opened or closed without turning the hand wheel or having a separate indicator plate which would show open or closed.

These valves are made up in strict accordance with all of the rules and requirements of the Underwriters, and can be identified by the marking "FU" on the bodies.

Prices on Application

SWING CHECK TYPE

FAIRBANKS BRONZE VALVES

BRONZE DISC

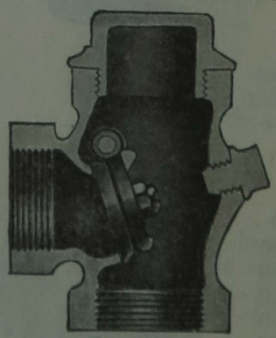


Fig. 3587
Angle Pattern

These well-known straightaway swing check valves with the Patent Rotating Disc work freely, never sticking in the seat. They have full area, equal to pipe connections and straightaway passage; are thoroughly tested and reliable. The valve is easily reground by removing angle plug (shown in cut), inserting a screwdriver into slot in disc head and revolving it sufficiently to reseat it without disconnecting from the pipe.

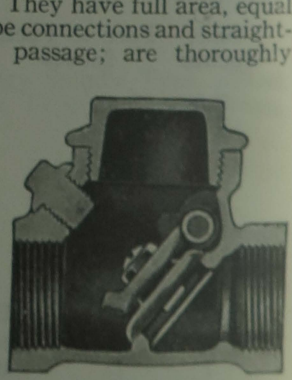


Fig. 3588
Straightaway Pattern

Prices and dimensions are listed on a following page.

FAIRBANKS BRONZE VALVES SWING CHECK TYPE

PARTS

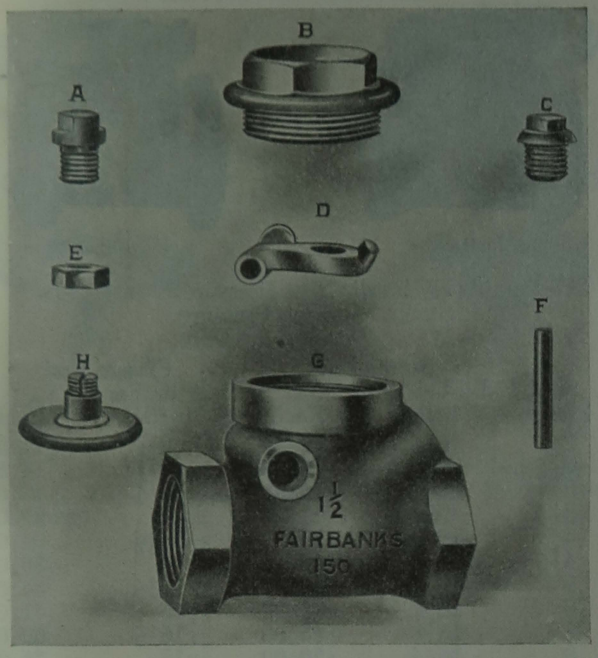


Fig. 3589

A—Side Plug
B—Cap
C—Angle Plug
D—Arm
E—Disc Stem Nut
F—Hinge Pin
G—Body
H—Disc

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

Fig. 3590

BRONZE DISCS

Size, Inches	1/4	3/8	1/2
Each	$0.10	.12	.14

Size, Inches	3/4	1	1 1/4	1 1/2	2	2 1/2	3
Each	$0.16	.18	.20	.25	.40	.60	.75

STRAIGHTAWAY PATTERN.

300 Pounds Hydraulic Test Pressure. 150 Pounds Steam Working Pressure. 175 Pounds Water Working Pressure.

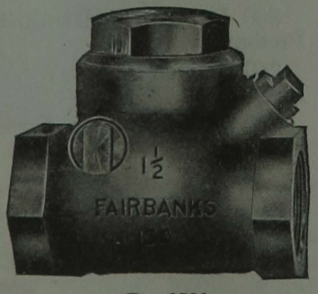


Fig. 3591

SCREW END

Size, Inches	End to End, Inches	Each	Size, Inches	End to End, Inches	Each
1/4	2 1/16	$2.50	1 1/4	3 13/16	$5.50
3/8	2 13/32	2.50	1 1/2	4 1/4	7.00
1/2	2 1/2	2.75	2	5 1/8	10.00
3/4	2 15/16	3.10	2 1/2	6 7/8	19.00
1	3 3/8	4.00	3	7 3/8	27.00

FAIRBANKS BRONZE VALVES SWING CHECK TYPE

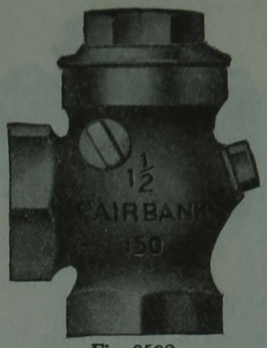


Fig. 3592

ANGLE PATTERN BRONZE DISC

300 Pounds Hydraulic Test Pressure. 150 Pounds Steam Working Pressure. 175 Pounds Water Working Pressure.

SCREW END

Size, Inches	Center to End, Inches	Each	Size, Inches	Center to End, Inches	Each
1/4	....	$2.50	1 1/4	1 7/8	$5.50
3/8	....	2.50	1 1/2	2 1/8	7.00
1/2	1 3/8	2.75	2	2 3/4	10.00
3/4	1 1/2	3.10	2 1/2	3 5/16	19.00
1	1 11/16	4.00	3	3 3/4	27.00

HEAVY PATTERN STRAIGHTAWAY BRONZE DISC

500 Pounds Hydraulic Test Pressure. 200 Pounds Steam Working Pressure. 250 Pounds Water Working Pressure.

Fig. 3593

SCREW END

Size, Inches	End to End, Inches	Each	Size, Inches	End to End, Inches	Each
1/4	2 5/8	$2.60	1	3 5/8	$4.00
3/8	2 5/8	2.60	1 1/4	4	5.75
1/2	2 5/8	2.60	1 1/2	4 3/8	7.50
3/4	3 1/8	3.00	2	5 3/8	11.00

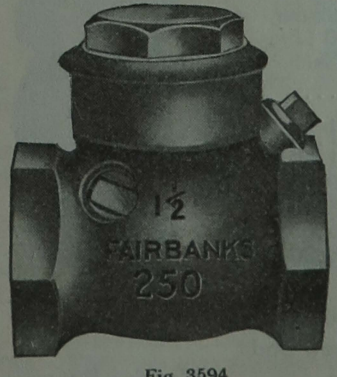


Fig. 3594

EXTRA HEAVY STRAIGHTAWAY BRONZE DISC

800 Pounds Hydraulic Test Pressure. 250 pounds Steam Working Pressure. 350 Pounds Water Working Pressure.

SCREW END

Size, Inches	End to End, Inches	Each	Size, Inches	End to End, Inches	Each
1/2	2 23/32	$5.00	1 1/4	4 9/32	$10.85
3/4	3 7/32	5.85	1 1/2	4 7/8	14.20
1	3 3/4	7.50	2	5 7/8	20.75

FAIRBANKS STANDARD BRONZE CHECK VALVES

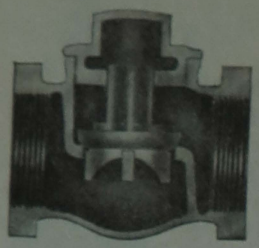


Fig. 3595

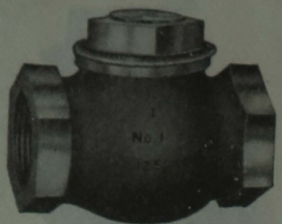


Fig. 3596

HORIZONTAL PATTERN

For Steam Working Pressures up to 125 Pounds

Well proportioned, of good weight and made of high-grade steam bronze. They are accurately machined and carefully inspected.

Each valve is subjected to hydraulic test.

Size, Inches	Screw End End to End Inches	Each	Size, Inches	End to End Inches	Each
1/4	1 11/16	$0.65	1	3 3/16	$1.60
3/8	1 11/16	.70	1 1/4	3 5/8	2.25
1/2	2 1/8	.90	1 1/2	4 1/16	3.15
3/4	2 5/8	1.15	2	5 1/16	4.75

BRONZE REGRINDING CHECK VALVES

We have overcome the continuous pounding of the disc upon the valve seat by distributing the metal in the disc so that the weight is reduced without sacrificing its strength, thus increasing the life of the valve.

GLOBE TYPE

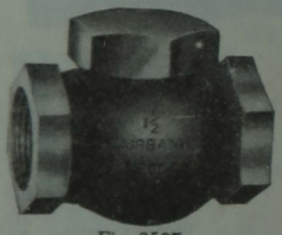


Fig. 3597

Size, Inches	Screw End Working Pressure 200 Lbs. Each	300 Lbs Each
1/4	$0.50	$0.70
3/8	.60	.70
1/2	.85	1.00
3/4	1.15	1.70
1	1.55	2.80
1 1/4	2.30	3.90
1 1/2	3.25	5.50
2	5.20	8.90

ANGLE TYPE

Size, Inches	Working Pressure 200 Lbs. Each	300 Lbs. Each
1/4	$0.50	....
3/8	.60	....
1/2	.85	$1.00
3/4	1.15	1.70
1	1.55	2.80
1 1/4	2.30	3.90
1 1/2	3.25	5.50
2	5.20	8.90

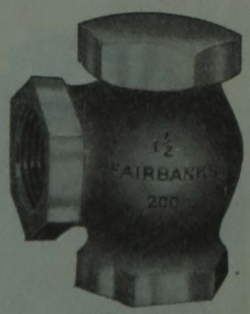


Fig. 3598

VERTICAL TYPE

Screw End

Size, Inches	Working Pressure 200 Lbs. Each	300 Lbs. Each	Size, Inches	Working Pressure 200 Lbs. Each	300 Lbs. Each
1/4	....	....	1	$1.55	$2.80
3/8	....	....	1 1/4	2.30	3.90
1/2	$0.85	$1.00	1 1/2	3.25	5.50
3/4	1.15	1.70	2	5.20	8.90

FAIRBANKS BRONZE VALVES SWING CHECK TYPE

STRAIGHTAWAY PATTERN BRONZE MOUNTED

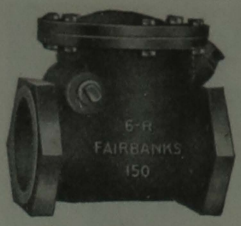


Fig. 3599

Fig. 3601

350 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	6 1/4	$12.00	8 3/4	$14.50
2 1/2	7 1/2	12.00	9 1/2	14.50
3	8 3/8	13.50	10 1/4	17.00
3 1/2	9 3/4	17.50	12	21.00
4	10	20.00	12 1/2	24.00
4 1/2	11	26.00	13	30.00
5	12	30.00	13 1/2	34.00
6	14	36.00	15	41.00
7	15	55.00	16 1/2	60.00
8	16 1/2	70.00	18	75.00
10	18 3/4	110.00	20 1/4	115.00
12	21 1/2	160.00	22 1/2	168.00

Angle Plug omitted in sizes above 6 inches.

Bell Ends

300 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
175 Pounds Water Working Pressure.

Fig. 3602

Size, Inches	End to End, Inches	Each
4	15 3/8	$27.00
6	18 3/4	45.00
8	20	82.50
10	22 1/2	125.00
12	24 3/4	185.00

EXTRA HEAVY

800 Pounds Hydraulic Test Pressure.

250 Pounds Steam Working Pressure.

350 Pounds Water Working Pressure.

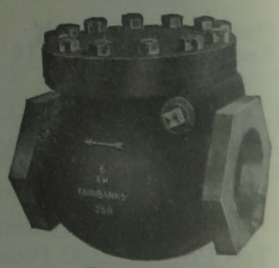


Fig. 3603

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
2	10	$26.00	11	$27.50
2 1/2	10 3/4	33.00	12 1/2	35.00
3	11 1/2	37.00	13	40.00
3 1/2	12 1/2	42.00	14	45.00
4	14	46.00	15 1/2	50.00
5	15 1/2	61.00	17 1/2	65.00
6	16 1/2	75.00	19	80.00
7	19	95.00	21	100.00
8	20	114.00	23	120.00
10	23 7/8	190.00	26 1/2	200.00
12	27 1/2	.....	30	300.00

PARTS FOR FAIRBANKS IRON BODY VALVES

SWING CHECK TYPE

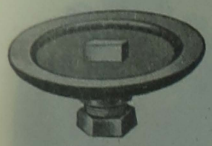


Fig. 3604
Ground Bronze

Fig. 3605
Vulcabeston Ring

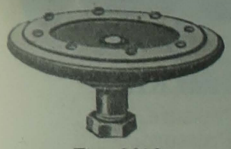


Fig. 3606
Leather Ring

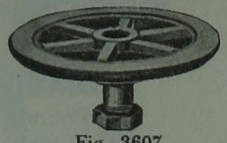


Fig. 3607
Iron Holder Bronze Ring

DISCS

Size, Inches	Ground Bronze, Each	Vulcabeston Ring, Each	Leather Ring, Each	Iron Holder Bronze Ring Each
2	$0.45	$0.90	$0.90	....
2½	.50	1.30	1.30	....
3	.60	1.50	1.50	....
3½	.75	2.40	2.40	....
4	1.15	2.65	2.65	....
5	1.35	3.10	3.10	....
6	2.00	3.75	3.75	....
7	3.00	4.50	4.50	....
8	....	6.00	6.00	$5.50
10	....	9.00	9.00	8.00
12	....	12.50	12.50	16.50
14	....	....	....	30.00
16	....	....	....	36.00

FAIRBANKS IRON BODY "SPECIAL" CHECK VALVE

FOR FIRE SERVICE CONNECTION

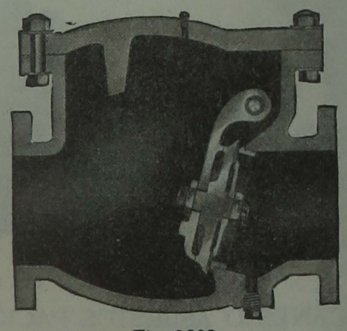


Fig. 3608

The Insurance Companies and Superintendents of Water Works have been working to perfect a Fire Service Connection which will prevent the raw water, from driven wells or other sources, from entering into the pipes and contaminating the filtered water when the public supply is used as an auxiliary to the system of fire protection.

They have specified a Check Valve, special in design, to embody bronze mounting, liberal clearances, rubber-faced clapper, etc., with a view to insuring perfect closing action and freedom from corrosion.

The Fairbanks "Special" Check Valve covers these features and is approved by the Insurance Companies.

Size Inches	6	8	10	12
Face to Face, Inches	18	20¾	23⅝	27
Each	$80.00	140.00	200.00	300.00

PARTS FOR FAIRBANKS VULCABESTON BRONZE AND IRON COCKS

VULCANIZED ASBESTOS PACKED PARTS

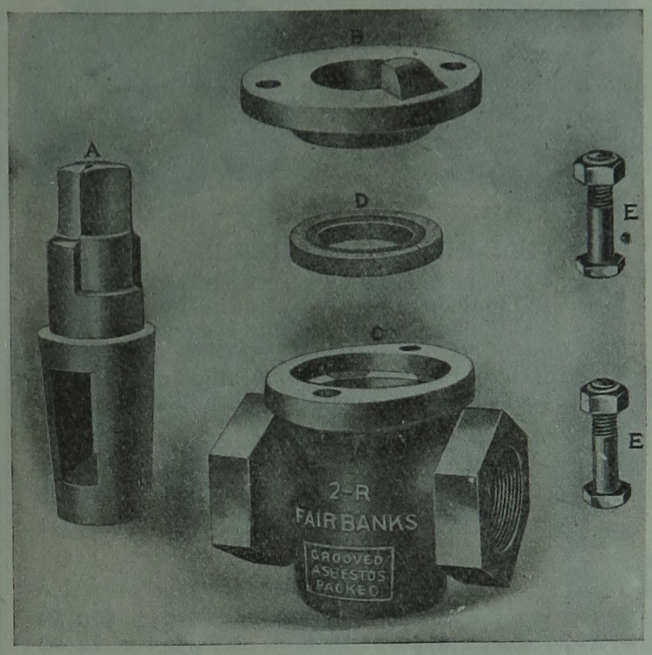


Fig. 3609

A—Plug
B—Gland
C—Body
D—Top Ring
E—Gland Bolts

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

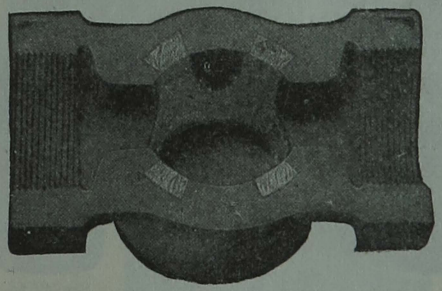


Fig. 3610

The above illustrates the Asbestos Packed Cock with a section of the body removed, in order that the packing may be shown.

The dovetailed U-shaped grooves in the body are packed with prepared asbestos, and a vulcabeston ring is used on the shoulder of the plug for top packing.

The plug is of standard taper, carefully finished, and buffed to render it rustless. It has no metallic bearing, coming in contact only with asbestos, the elasticity of which compensates for the differential expansion and contraction of the plug and body.

These cocks are recommended where ground plug cocks are unsatisfactory, and where globe, angle or gate valves fail. They are also successfully used for hydraulics, gas, acid, oil and air.

Experience shows that it is best to use an Asbestos Packed Cock to its full capacity, wide open, rather than partially open.

Prices and dimensions are listed on the following page.

A catalogue showing our complete line of valves will be sent on request.

FAIRBANKS VULCABESTON BRONZE COCKS

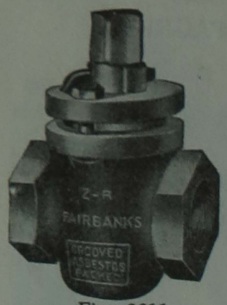


Fig. 3611

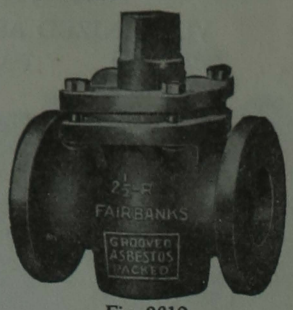


Fig. 3612

VULCANIZED ASBESTOS PACKED

400 Pounds Hydraulic Test Pressure.
150 Pounds Steam Working Pressure.
200 Pounds Water Working Pressure.

This type of cock is recommended where ground cocks are unsatisfactory and where globe, angle or gate valves fail. Are also successfully used for hydraulic, gas, acid, oil and air.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
¼	2⅝	$3.35	....	.....
⅜	2⅝	3.35	....	.....
½	3	3.35	4	.....
¾	3⅜	4.20	4¾	.....
1	4	5.60	5½	$10.50
1¼	4⅝	8.00	5¾	12.50
1½	5¼	10.35	5⅞	14.50
2	6	16.00	7⅛	26.00
2½	7	26.50	8¼	38.00
3	8⅛	37.50	9¼	49.00
3½	8¾	50.50	10¼	69.50
4	9½	64.00	11½	90.00

VULCABESTON IRON COCKS

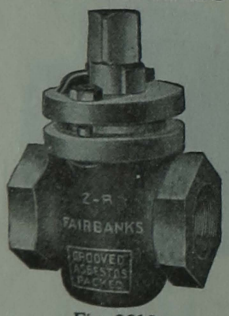


Fig. 3613

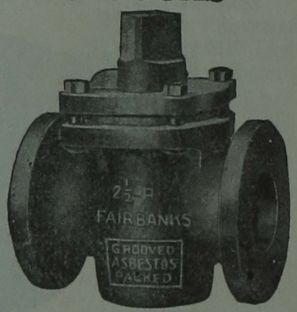


Fig. 3614

VULCANIZED ASBESTOS PACKED

300 Pounds Hydraulic Test Pressure.
125 Pounds Steam Working Pressure.
150 Pounds Water Working Pressure.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
⅛	....	$1.30	....	.....
¼	2⅝	1.30	....	.....
⅜	2⅝	1.45	....	.....
½	3	1.60	4	.....
¾	3⅜	2.10	4¾	.....
1	4	2.50	5½	$2.50
1¼	4⅝	3.50	5¾	3.50
1½	5¼	4.75	5⅞	4.75
2	6	7.00	7⅛	7.00
2½	7	12.00	8¼	12.00
3	8⅛	18.00	9¼	18.00
3½	8¾	27.00	10¼	27.00
4	9½	30.00	11½	30.00
5	11½	45.00	13¾	45.00
6	14¾	60.00	16	60.00

FAIRBANKS VULCABESTON HEAVY IRON COCKS

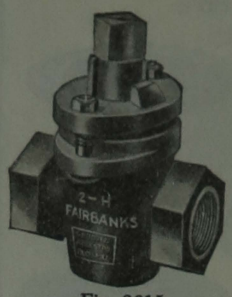


Fig. 3615

Fig. 3616

VULCANIZED ASBESTOS PACKED

500 Pounds Hydraulic Test Pressure.
200 Pounds Steam Working Pressure.
225 Pounds Water Working Pressure.

These cocks are recommended where ground plug cocks are unsatisfactory and where globe, angle or gate valves fail. They are also successfully used for hydraulics, gas, acid, oil and air.

Size, Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
¼	3¼	$1.50	....	.....
⅜	3¼	1.75	....	.....
½	3⅞	2.00	4	.....
¾	4⅛	2.50	4¼	.....
1	4¾	3.00	4⅞	$3.00
1¼	5⅜	4.25	5⅝	4.25
1½	5⅞	5.75	6¼	5.75
2	6⅞	8.50	7⅛	8.50
2½	7¾	14.50	8¾	14.50
3	10	21.50	10⅛	21.50
3½	10½	32.50	11¼	32.50
4	13⅝	36.00	12¼	36.00

VULCABESTON EXTRA HEAVY IRON COCKS

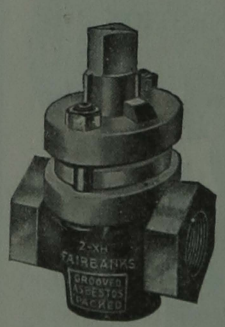


Fig. 3617

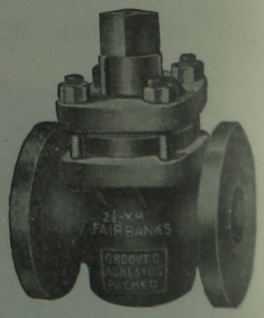


Fig. 3618

VULCANIZED ASBESTOS PACKED

800 Pounds Hydraulic Test Pressure.
250 Pounds Steam Working Pressure.
350 Pounds Water Working Pressure.

Size Inches	Screw End End to End, Inches	Each	Flange End Face to Face, Inches	Each
½	3¾	$2.40	4	.....
¾	4⅛	3.00	4¼	.....
1	4¾	3.50	5⅛	$3.50
1¼	5⅜	5.00	5⅝	5.00
1½	5⅞	6.75	6¾	6.75
2	6⅞	10.00	8	10.00
2½	8⅜	17.00	10	17.00
3	10⅞	26.00	11½	26.00
3½	12	38.00	12¾	38.00
4	15	42.00	15	42.00

FAIRBANKS VULCABESTON IRON COCKS

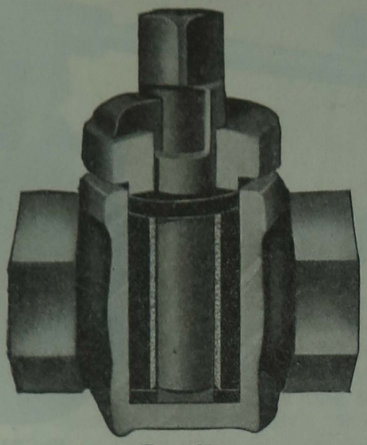


Fig. 3619

VULCANIZED ASBESTOS PACKED LOCOMOTIVE PATTERN

The above illustration shows Asbestos Packed Locomotive Blow-off Cock, with a section of the body removed in order that the plug and packing may be seen.

The dovetailed grooves in the body are packed with prepared asbestos, and a vulcabeston ring is used between the gland and the shoulder of the plug for top packing. The bottom packing is a vulcabeston ring, reinforced by a lead washer. The plug is straight, carefully finished and buffed to render it rustless.

These Cocks are used for locomotive service.

Cut illustrates Cock with quarter stop; can be made plain plug, no stop.

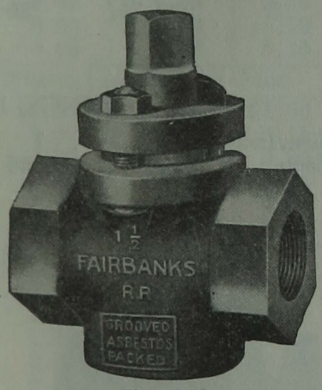


Fig. 3620

200 Pounds Steam Working Pressure.

Screw End		
Size, Inches...	1½	2
End to End, In.	5 9/16	6½
Each	$5.75	8.50

WRENCHES

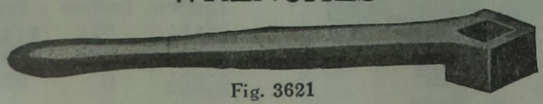


Fig. 3621

Size, Inches	¼	⅜	½	¾
Each	$0.10	.10	.10	.20
Size, Inches	1	1¼	1½	2	2½
Each	$0.20	.30	.40	.50	1.00
Size, Inches	3	3½	4	5	6
Each	$1.50	1.60	1.75	3.00	3.00

TOP RINGS

Fig. 3622

Size, Inches	¼	⅜	¾
Each	$0.08	.08	.08
Size, Inches	¾	1	1¼
Each	$0.11	.17	.20

Size, Inches	1½	2	2½	3
Each	$0.25	.34	.50	.80
Size, Inches	3½	4	5	6
Each	$1.04	1.80	2.50	5.00

FAIRBANKS INDICATOR VALVE POSTS

FOR FIRE PROTECTION VALVES

PATENT APPLIED FOR

Fig. 3623

This post shows plainly whether the Valve is Opened or Closed, and is intended to be used with fire-protection valves in street mains, factory and mill yards, grounds of public buildings, etc. It is specified by the Fire Underwriters for this purpose, and prevents all delay and mistakes in finding and operating the valve.

The size and shape of the operating nut will be made to conform to the standard of the system in which the valves are to be used. The Fairbanks standard for operating nut is 1¼ inches square.

In ordering, state whether valves turn to right or to left to open; distance from surface of ground to bottom of pipe; number of turns required to open valve; size and shape of operating nut.

Fig. 3624

	Each
Indicator Post Only for 5-Foot Trench	$30.00

For Post and Valve complete, add to price of Indicator Post, as above given, the price of size and style of valve to be used.

	Each
Wrench for Top Nut	$1.00

FAIRBANKS SPHER-O VALVES

WORM GEAR ATTACHMENT

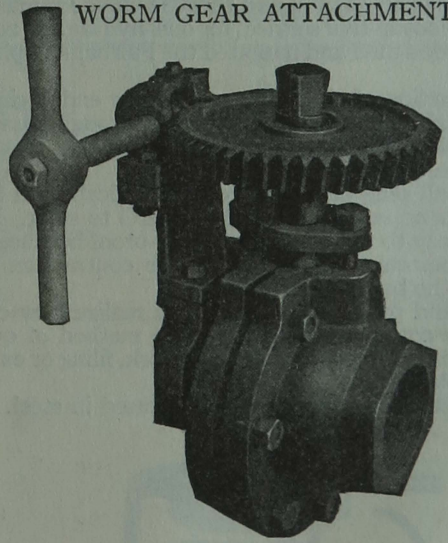


Fig. 3625

200 Pounds Working Pressure.

This is our 4-inch Spher-O Valve made with or without Worm Gear Attachment, and with either Screw Ends or Flange Ends. **Prices on Application**

Threads: Briggs Standard Gauge

The threads in all our valves, up to and including 12-inch, are tapped to Briggs Standard Gauge, which has also been adopted as the Universal Standard by all the leading Manufacturers of Wrought Pipe, Valves and Fittings in the United States.

British Standard Thread

We furnish our valves with the British Standard Thread as adopted by the Engineering Standards Committee in revised report under date of November, 1909, when English threads are specified.

FAIRBANKS SPHER-O VALVES

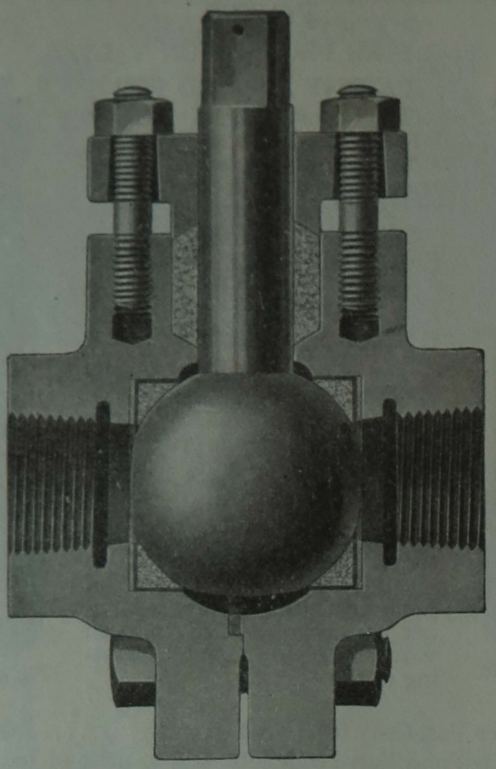


Fig. 3626

SECTIONAL VIEW

To meet the need of an easily operated, quickly repaired valve—one that can be used as a Blow-off, or in rubber, soap and galvanizing plants; as a throttle valve for marine, stationary or locomotive service; for oils, hydraulics, acids, etc., we have designed and patented the Fairbanks SpherO Valve.

The construction of either flange or screw end is simple and substantial. The valve has straight through passageway, renewable seats, interchangeable parts, and is easily opened or closed.

Since the ball plug bears only on the Vulcabeston Seat Rings, there is no tendency for the SpherO to stick. It is surprisingly easy to turn, and stays leak-proof because the elastic Vulcabeston compensates for the contraction and expansion of the ball plug.

Engineers and purchasing agents will realize how carefully we have covered in this valve the method of quick and easy repair, as it requires no lathe work, filing or expert service to replace parts.

Standard seats are of Vulcabeston encased in steel.

PARTS

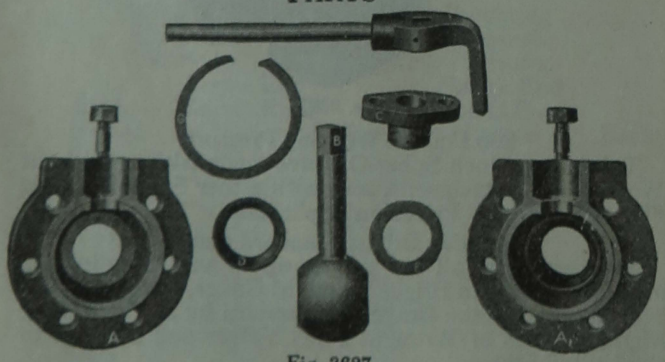


Fig. 3627

A—Bodies. B—Ball Plug. C—Follower. D—Seat Ring. E—Seat Ring Gasket.

In ordering parts, specify them by reference to the names and to the descriptive letters and the size of valve.

FAIRBANKS SPHER-O VALVES

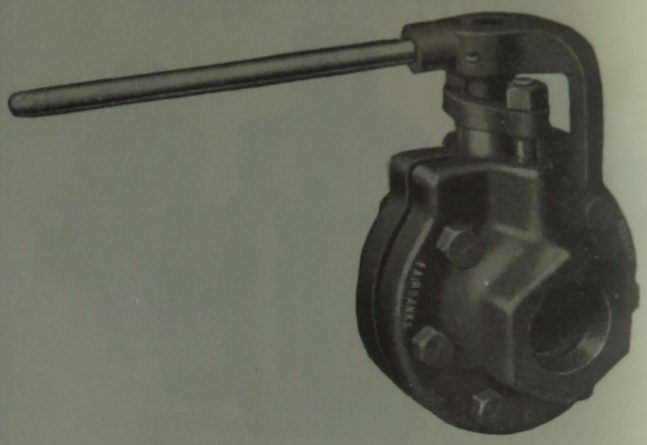


Fig. 3628

200 Pounds Working Pressure

Size, Inches	Screw End, End to End, Inches	Each	Flange End Face to Face, Inches	Each
1	4 1/8	$8.00	5 1/2	$8.00
1 1/4	4 1/2	10.75	5 5/8	10.75
1 1/2	4 3/4	13.75	6 3/8	13.75
2	5 7/8	19.00	7 5/8	19.00
2 1/2	6 3/4	25.00	8 1/2	25.00
3	7 3/4	35.00	9 1/2	35.00

RINGS, ENCASED

Size, Inches	1	1 1/4	1 1/2	2	2 1/2	3
Each	$0.65	.70	.80	1.00	1.25	1.65

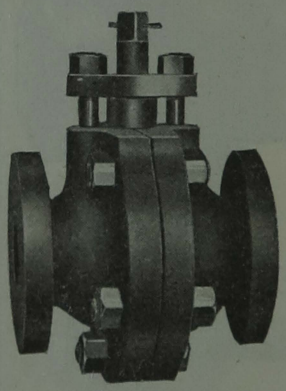


Fig. 3628A

STRAIGHT PATTERN FLANGE END

250 Pounds Working Pressure.

Size, Inches	Face to Face, Inches	Each
1 1/2	7 1/8	$14.25
2	7 3/4	20.50
2 1/2	9	27.00

ANGLE FLANGE END

250 Pounds Working Pressure.

Size, Inches	Center to Face, Inches	Each
1 1/2	5 5/16	$15.75
2	5 3/4	22.55
2 1/2	7 1/16	30.00

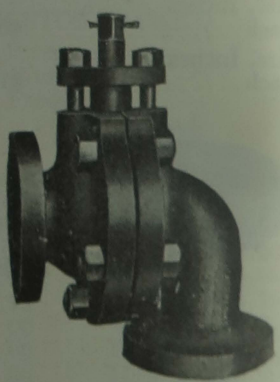


Fig. 3628B

BRASS NEEDLE VALVES

MEDIUM PATTERN

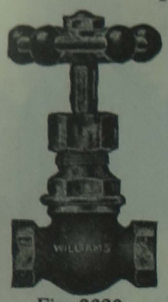


Fig. 3629

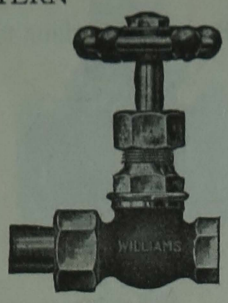


Fig. 3630

Intended for controlling gas, gasoline, oil, air or any other liquid or gaseous vapor the use of which requires close regulation of the volume through the valve. Made of the best grade of steam bronze. Has long tapering needle point and seat opening, and fine pitch of thread on the stem. Furnished in globe angle or cross types.

Size, Inches	Seat Openings, Inches	Angle and Globe Female Openings, Each	Cross Female Openings, Each	Angle and Globe with Union, Each	Cross with Union, Each
Brass Stem and Iron Wheel, Rough					
1/8	1/8	$0.65	$0.95	$0.80	$1.10
1/4	3/16	.75	1.25	.95	1.45
3/8	1/4	.85	1.50	1.15	1.75
1/2	5/16	1.60	2.40	1.95	2.75
3/4	7/16	2.00	3.00	3.10	4.10
1	5/8	2.80	4.00	4.00	5.10
Brass Stem and Brass Wheel, Finished All Over					
1/8	1/8	$1.00	$1.40	$1.20	$1.60
1/4	3/16	1.10	1.90	1.35	2.15
3/8	1/4	1.25	2.25	1.50	2.50
1/2	5/16	2.25	3.40	2.60	3.10
3/4	7/16	2.90	4.20	3.50	4.70
1	5/8	3.80	5.20	4.50	5.70
Steel Stem and Iron Wheel, Rough					
1/8	3/64	$0.60	$0.90	$0.75	$1.05
1/4	1/16	.70	1.20	.95	1.55
3/8	3/32	.80	1.45	1.10	1.75
1/2	1/8	1.45	2.25	1.75	2.55
3/4	3/16	1.85	2.80	2.50	3.45
1	1/4	2.60	3.80	3.50	4.45
Steel Stem and Brass Wheel, Finished All Over					
1/8	3/64	$0.95	$1.35	$1.15	$1.55
1/4	1/16	1.05	1.80	1.30	2.05
3/8	3/32	1.20	2.15	1.45	2.40
1/2	1/8	2.00	3.10	2.40	3.50
3/4	3/16	2.65	3.90	3.15	4.65
1	1/4	3.60	4.90	4.15	5.65

When ordering state whether brass or steel stem valves are wanted. Brass will be sent unless otherwise stated.

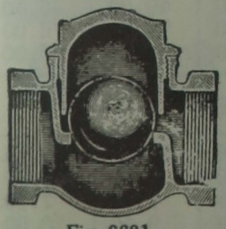


Fig. 3631

BALL CHECK VALVES

For steam working pressure up to 125 pounds. Brass body. Furnished in horizontal angle or vertical type at same list. Unless otherwise ordered, horizontal type will be furnished.

Size, Inches	Each	Size, Inches	Each
1/2	$1.60	1 1/4	$4.00
3/4	2.30	1 1/2	6.20
1	3.10	2	9.40

DIAL COCKS

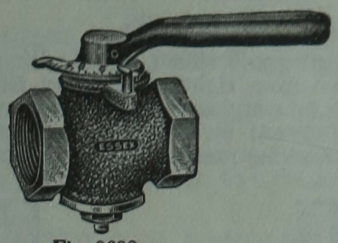


Fig. 3632

For gas engines. Made of brass. Has full area through the key.

Size, Inches	Each	Size, Inches	Each
3/8	$2.70	1 1/2	$9.25
1/2	2.90	2	14.00
3/4	3.40	2 1/2	29.00
1	4.50	3	44.00
1 1/4	7.10	....	....

BUTTERFLY VALVES

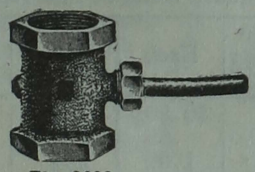


Fig. 3633

For steam working pressure up to 124 pounds.

SCREWED

Size, Inches	Brass Body		Iron Body	
	End to End Inches	Each	End to End Inches	Each
3/4	2 1/8	$3.10	....	....
1	2 1/2	4.40	....	....
1 1/4	2 7/8	5.65	3 1/4	$6.35
1 1/2	3 1/8	6.75	3 5/8	7.00
2	3 3/4	10.00	4 3/16	8.00
2 1/2	4 1/2	13.75	4 13/16	9.50
3	5 3/8	21.00	5 9/16	12.00
3 1/2	....	....	6 1/4	16.00
4	....	....	6 7/8	18.50
5	....	....	8 1/4	28.50
6	....	....	9 1/2	42.50

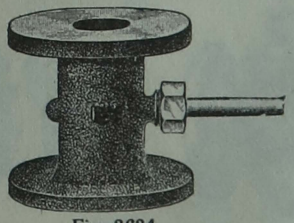


Fig. 3634

FLANGED

For steam working pressure up to 125 pounds.

Size, Inches	Face to Face, Inches	Diam. Flanges, Inches	Brass, Each	Iron Body
1 1/4	4	4 1/2	....	$7.50
1 1/2	4 1/2	5	$14.00	8.50
2	5	6	21.00	9.50
2 1/2	5 1/2	7	27.00	11.50
3	6	7 1/2	42.00	15.00
3 1/2	6 1/2	8 1/2	....	19.00
4	7 1/2	9	....	22.00
5	8 1/2	10	....	32.00
6	9 1/2	11	....	47.00

STEAM COCKS

BRASS

Made of high grade steam metal with patent guard; interchangeable from right to left and for lever or tee handle or hydrant; impossible to set it wrong; accurately machined and tested; for iron pipe; rough finish.

For steam working pressure up to 125 pounds.

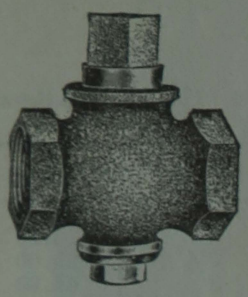


Fig. 3635

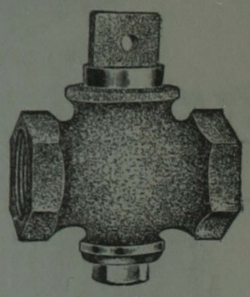


Fig. 3636

STANDARD—SCREWED

Square Head or Flat Head

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
1/8	1/4	$0.85	1 1/2	5	$4.85
1/4	1/4	.85	2	9 1/2	7.30
3/8	1/2	1.00	2 1/2	15	14.50
1/2	5/8	1.25	3	....	22.50
3/4	1	1.70	3 1/2	....	38.50
1	1 1/2	2.35	4	....	50.00
1 1/4	3 1/3	3.70	....	....	....

THREE-WAY—SCREWED

Square Head or Flat Head

Size, Inches	Weight Each, Lbs.	Each	Size, Inches	Weight Each, Lbs.	Each
1/4	5/8	$2.10	1 1/2	4 7/8	$7.15
3/8	5/8	2.10	2	9 1/2	11.00
1/2	1	2.50	2 1/2	...	18.75
3/4	1 1/4	3.00	3	...	26.00
1	2 1/4	3.75	3 1/2	...	50.00
1 1/4	3 3/4	5.75	4	...	70.00

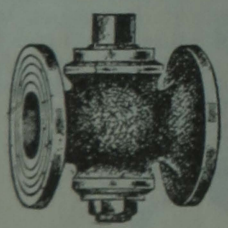


Fig. 3637

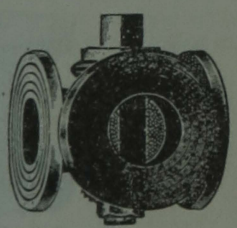


Fig. 3638

FLANGED

Size, Inches	Diam. Flanges, Inches	Face to Face Stand., Inches	Face to Face 3-Way, Inches	Standard, Each	3-Way, Each
1	4	4	4 1/4	$7.30	$11.25
1 1/4	4 1/2	4 1/2	5	9.70	14.75
1 1/2	5	5	5 1/2	11.75	17.75
2	6	6	6 1/2	18.00	27.00
2 1/2	7	7	7 1/2	27.50	38.25
3	7 1/2	8	8 1/2	43.00	57.00
3 1/2	8 1/2	9	9 1/2	62.00	85.00
4	9	9 1/2	10 1/2	84.00	121.00

STEAM COCKS

IRON

For steam working pressure up to 125 pounds.

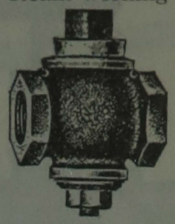


Fig. 3639

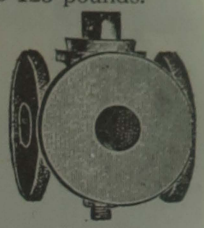


Fig. 3640

STANDARD SCREWED

Size, Inches	All Iron, Each	With Brass Washer, Each	With Brass Plug, Each	With Brass Plugs and Washer, Each
3/8	$0.85	.....	.....	$1.25
1/2	.90	$1.00	$1.40	1.30
3/4	1.05	1.20	1.75	1.60
1	1.30	1.55	2.15	1.90
1 1/4	1.60	1.95	3.00	2.65
1 1/2	1.95	2.35	4.15	3.75
2	2.70	3.20	5.75	5.25
2 1/2	4.40	5.15	9.50	8.75
3	6.75	7.75	14.00	13.00
3 1/2	12.00	14.00	29.50	27.50
4	15.50	19.00	40.00	36.50
5	32.00	38.00	73.00	67.00
6	45.00	53.00	102.00	94.00

3-WAY—SCREWED

3/4	$1.65	$1.80	$2.35	$2.20
1	1.80	2.05	2.65	2.40
1 1/4	2.05	2.40	3.45	3.10
1 1/2	2.65	3.05	4.90	4.50
2	3.65	4.15	6.75	6.25
2 1/2	5.35	6.10	10.50	9.75
3	7.50	8.50	14.75	3.75
3 1/2	14.00	16.00	32.00	30.00
4	19.00	22.50	43.00	40.00
5	36.50	42.50	77.50	71.50
6	52.00	60.00	108.00	60.00

STANDARD—FLANGED

Size, Inches	Diam. Flanges, Inches	All Iron, Each	With Brass Washer, Each	With Brass Plug, Each	With Brass Plugs and Washer, Each
1 1/4	4	$2.25	$2.50	$3.00	$3.25
1 1/4	4 1/2	2.75	3.10	3.25	4.10
1 1/2	5	3.25	3.65	5.00	5.40
2	6	4.25	4.75	7.00	7.50
2 1/2	7	6.25	7.00	10.50	11.25
3	7 1/2	9.50	10.50	15.75	16.75
3 1/2	8 1/2	15.00	17.00	30.00	32.00
4	9	19.00	22.50	40.00	43.50
5	10	36.00	42.00	70.00	76.00
6	11	50.00	58.00	100.00	108.00

3-WAY—FLANGED

1	4	$3.75	$4.00	$4.50	$4.75
1 1/4	4 1/2	4.25	4.60	5.25	5.60
1 1/2	5	5.25	5.65	7.00	7.40
2	6	7.00	7.50	9.50	10.00
2 1/2	7	9.00	9.75	13.25	14.00
3	7 1/2	12.75	13.75	19.00	20.00
3 1/2	8 1/2	20.00	22.00	36.00	38.00
4	9	26.00	29.50	47.00	50.50
5	10	44.00	50.00	80.00	86.00
6	11	60.00	68.00	108.00	108.00

GAS COCKS

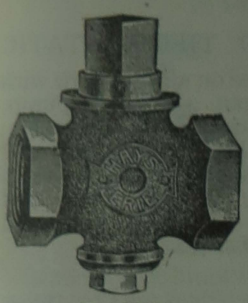


Fig. 3641

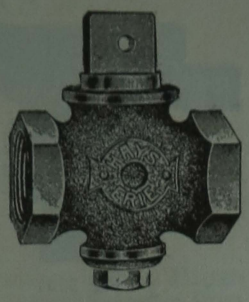


Fig. 3642

For gas service. Accurately machined and threaded.

Size, Inches	Flat Square and Tee Head, Each	Male and Female, Each	Size, Inches	Flat Square and Tee Head, Each	Male and Female, Each
1/8	$0.90	....	1 1/4	$3.25	$3.65
1/4	.90	....	1 1/2	4.60	5.45
3/8	1.00	$1.20	2	8.00	9.15
1/2	1.10	1.30	2 1/2	17.50	....
3/4	1.30	1.55	3	27.00	....
1	2.10	2.40	....	....	....

AIR COCKS

Made of steam metal, rough or finished. Will not leak. Can be supplied (special) with spring washer which takes up the wear.

WITH TEE HANDLES

FEMALE—BOTH ENDS

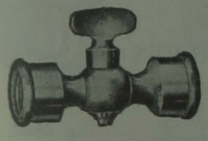


Fig. 3643

NOS.	Size, Inches	Rough, Each	Finished, Each
37	1/8	$0.60	$0.65
38	1/4	.65	.70
39	3/8	.80	.85
39 1/2	1/2	.95	1.00

MALE AND FEMALE

NOS.	Size, Inches	Rough, Each	Finished, Each
40	1/8	$0.70	$0.75
41	1/4	.75	.80
42	3/8	.85	.90
42 1/2	1/2	1.00	1.05

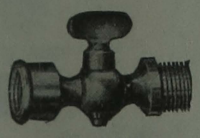


Fig. 3644

WITH LEVER HANDLES

FEMALE—BOTH ENDS

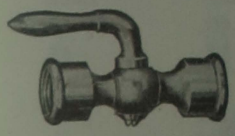


Fig. 3645

NOS.	Size, Inches	Rough, Each	Finished, Each
43	1/8	$0.75	$0.80
44	1/4	.80	.85
45	3/8	.95	1.00
45 1/2	1/2	1.10	1.15

MALE AND FEMALE

NOS.	Size, Inches	Rough Each	Finished Each
46	1/8	$0.85	$0.90
47	1/4	.90	.95
48	3/8	1.00	1.05
48 1/2	1/2	1.15	1.20

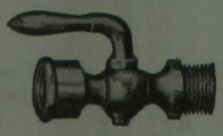


Fig. 3646

AIR COCKS

Properly designed and well finished. They are carefully manufactured of high grade steam metal and will not leak air, gasoline, water or steam.

Air cocks are either furnished regularly with spring or can be so supplied upon request. The spring keeps the cock tight by taking up any wear and permits the key, without too tight an adjustment, to turn easily.

WITH TEE HANDLES

STRAIGHT NOSE

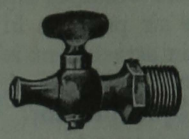


Fig. 3647

NOS.	Size, Inches	Rough Each	Finished Each
6	1/8	$0.35	$0.40
7	1/4	.40	.45
8	3/8	.45	.50
9	1/2	.55	.60
10	3/4	.85	.90
11	1	1.00	1.15

MALE BOTH ENDS

NOS.	Size, Inches	Rough Each	Finished Each
18	1/8	$0.50	$0.55
19	1/4	.60	.65
20	3/8	.70	.75
21	1/2	.85	.90

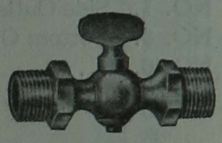


Fig. 3648

BIBB NOSE

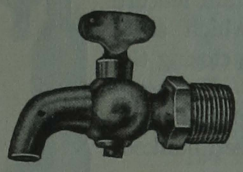


Fig. 3649

NOS.	Size, Inches	Finished, Each
26	1/8	$0.70
27	1/4	.80
28	3/8	.90
28a	1/2	1.00

WITH LEVER HANDLES

STRAIGHT NOSE

NOS.	Size, Inches	Rough Each	Finished Each
12	1/8	$0.50	$0.55
13	1/4	.55	.60
14	3/8	.60	.65
15	1/2	.70	.75
16	3/4	1.00	1.05
17	1	1.25	1.30

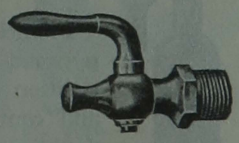


Fig. 3650

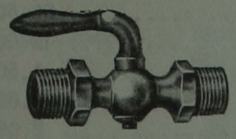


Fig. 3651

MALE BOTH ENDS

NOS.	Size, Inches	Rough, Each	Finished, Each
22	1/8	$0.65	$0.70
23	1/4	.75	.80
24	3/8	.85	.90
25	1/2	1.00	1.05

BIBB NOSE

NOS.	Size, Inches	Finished, Each
29	1/8	$0.85
30	1/4	.95
31	3/8	1.05
32	1/2	1.15

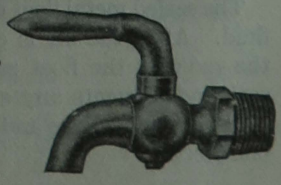


Fig. 3652

RADIATOR AIR VALVES

MONASH—IMPROVED FOUR-WAY

Fig. 3653

Four-way Drain, automatic; for low pressure work. It is self-cleaning and adjustable and may be locked after adjustment is made. Operates the same whether pressure is one or ten pounds. All working parts are above opening to the radiator. Made with a special air tube which conducts the air from the radiator to the top of the valve, where it escapes through the outlet equalizing the air pressure in the valve. The four-way drain attachment is free to carry off any accumulation of core sand, dirt and water, returning it to the radiator. Can also be furnished with air escape to carry off the air coming from radiator so it will not escape into room.

		Each
NO. 1.	Side Outlet	$2.00
NO. 3.	Bottom Outlet	2.00
NO. 6.		3.00
NO. 7.		3.00

VACUUM—FOUR-WAY DRAIN

Adjustable, self-cleaning. Will double heating effect of a radiator. The vacuum feature consists of a composition disc which seats itself over the opening in the screw, closing the valve against ingress of air and creating a "vacuum" in the radiator, thus retaining the heat after the fire in furnace has been banked.

Fig. 3654

		Each
NO. 1.	Side or Bottom Outlet	$3.00

Fig. 3655

DUPLEX BRAND

Flotation by water and expansion of a pyramid-shaped vulcanite plug of special composition which allows for expansion from heat and contraction from water. Made with a double opening into radiator with a single connection.

		Each
NO. 1.	Side Outlet	$1.50
NO. 2.	Heat Controller	2.00
NO. 3.	Bottom Outlet	1.50
NO. 4.	Air Escape	2.00
NO. 6.	Lockshield	2.00
NO. 7.	Vacuum, Lockshield	2.00

MOVACO—NON-ADJUSTABLE

The sealed metal float contains volatile fluid. After the air is eliminated from the radiator the float raises against its seat and prevents any escape of water. Will not leak. Base and nipple made in one piece.

Fig. 3656

		Each
NO. 0		$2.50

RADIATOR AIR VALVES

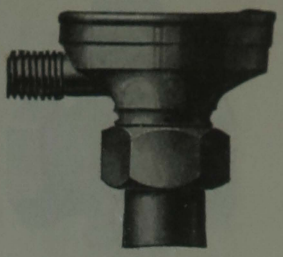


Fig. 3C57

LIQUID THERMOSTATIC

For use on air line work with or without a vacuum pump. Automatic and non-adjustable; allows the passage of air and prevents the passage of steam into the air line; rapid and positive in action under all conditions.

		Each
NO. 2.	Radiator Connection, ⅛ Inch; Air Line Connection, ¼ Inch	$3.00

EXPANSION VALVES, AUTOMATIC

FOR STEAM RADIATORS AND HEATING COILS

NO. 1

Size, ⅛x⅛ Inches

Per Dozen **$7.50**

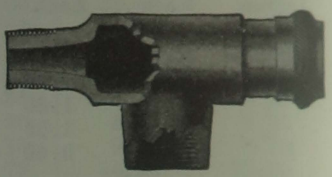


Fig. 3C58

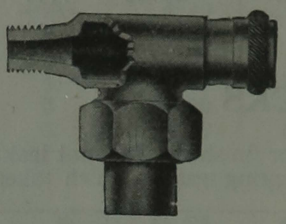


Fig. 3659

NO. 8

Sizes ⅛x⅛ Inches or ⅛x¼ Inches

Per Dozen **$12.00**

Size ⅛x¼ furnished unless otherwise specified.

DRIP CUPS

FOR USE WITH AUTOMATIC VALVES

Per Dozen **$3.00**

Fig. 3660

COMPRESSION RADIATOR AIR VALVES

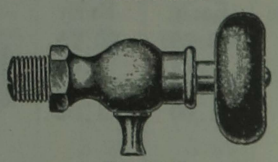


Fig. 3661

NOS.	Size Connection, Inches	Plain, Each	Nickel Plated, Each
2	⅛	$0.40	$0.45
2A	¼	.50	.55

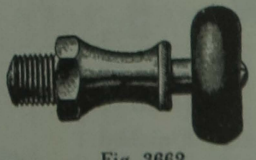


Fig. 3662

NOS.	Size Connection, Inches	Plain, Each	Nickel Plated, Each
3	⅛	$0.65	$0.70
3A	¼	.70	.75

STOP COCKS

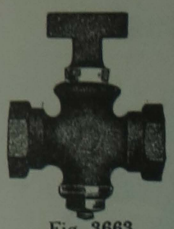


Fig. 3663

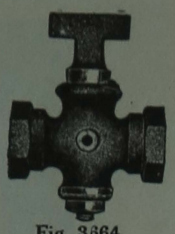


Fig. 3664

Made of cast brass with rough or finished bodies. Patent guard and malleable iron handles; interchangeable from right to left and for lever or tee handle or hydrant; accurately machined and tested; iron pipe threads.

FLAT WAY WITH "T" HANDLE

Size, Inches	Per Dozen Rough	Finished	Nickel Plated
1/4	$19.80	$24.60	$29.40
3/8	20.40	25.20	30.00
1/2	21.00	25.80	30.60
5/8	29.40	35.40	41.40
3/4	36.00	45.00	54.00
1	52.80	64.80	76.80
1 1/4	89.40	107.40	125.40
1 1/2	149.40	179.40	209.40
2	258.00	300.00	342.00
2 1/2	408.00	468.00	528.00
3	540.00	624.00	708.00

STOP AND WASTE

1/4	$20.40	$25.20	$30.00
3/8	21.00	25.80	30.60
1/2	21.60	26.40	31.20
5/8	30.00	36.00	42.00
3/4	36.60	45.60	54.60
1	54.00	66.00	78.00
1 1/4	91.20	109.20	127.20
1 1/2	152.40	182.40	212.40
2	264.00	306.00	348.00
2 1/2	420.00	480.00	540.00
3	558.00	642.00	726.00

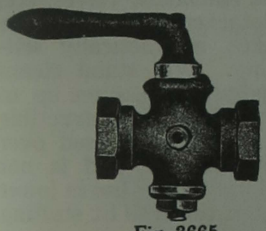


Fig. 3665

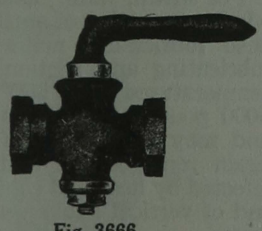


Fig. 3666

FLAT WAY WITH LEVER HANDLE

Size, Inches	Per Dozen Rough	Finished	Nickel Plated
1/4	$19.80	$24.60	$29.40
3/8	20.40	25.20	30.00
1/2	21.00	25.80	30.60
5/8	29.40	35.40	41.40
3/4	36.00	45.00	54.00
1	52.80	64.80	76.80
1 1/4	89.40	107.40	125.40
1 1/2	149.40	179.40	209.40
2	258.00	300.00	342.00
2 1/2	408.00	468.00	528.00
3	540.00	624.00	708.00

STOP AND WASTE

1/4	$20.40	$25.20	$30.00
3/8	21.00	25.80	30.60
1/2	21.60	26.40	31.20
5/8	30.00	36.00	42.00
3/4	36.60	45.60	54.60
1	54.00	66.00	78.00
1 1/4	86.00	109.20	127.20
1 2/3	152.40	182.40	212.40
2	264.00	306.00	348.00
2 1/2	420.00	480.00	540.00
3	558.00	642.00	726.00

BIBBS

Fig. 3667

Fig. 3668

COMPRESSION

Plain compression bibbs, with iron pipe threads; cast brass; accurately machined; deep cut threads; smooth interior; seat washers are of composition suitable for either hot or cold water; 4 1/8 inches over all.

PLAIN

Size, Inches	Per Dozen Rough	Finished	Nickel Plated
1/4	$16.20	$18.00	$21.60
3/8	16.80	18.60	22.20
1/2	14.40	19.80	23.40
5/8	22.80	25.20	28.80
3/4	30.60	33.00	37.20
1	54.00	60.00	66.00
1 1/4	106.80	140.00	124.80
1 1/2	139.20	150.00	165.00
2	282.00	300.00	330.00

HOSE

3/8	$19.80	$21.60	$25.20
1/2	20.40	22.80	26.40
5/8	25.80	28.20	31.80
3/4	33.60	36.00	40.20
1	61.20	67.20	73.20
1 1/4	117.60	124.80	135.60
1 1/2	154.20	165.00	180.00
2	304.20	322.20	352.20

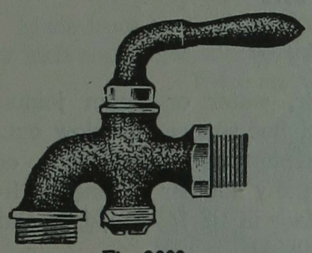


Fig. 3669

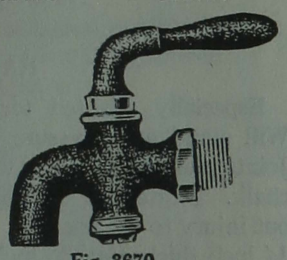


Fig. 3670

GROUND KEY WITH LEVER HANDLE

Ground key bibbs of cast brass with iron pipe threads; rough or finished bodies; smooth finished interior.

PLAIN

Size, Inches	Per Dozen Rough	Finished	Nickel Plated
1/4	$19.80	$24.60	$29.40
3/8	20.40	25.20	30.00
1/2	21.00	25.80	30.60
5/8	29.40	35.40	41.40
3/4	36.00	45.00	54.00
1	52.80	64.80	76.80
1 1/4	89.40	107.40	125.40
1 1/2	149.40	179.40	209.40
2	258.00	300.00	342.00

HOSE

3/8	$23.40	$28.20	$33.00
1/2	24.00	28.80	33.60
5/8	32.40	38.40	44.40
3/4	39.00	48.00	57.00
1	60.00	72.00	84.00
1 1/4	100.20	118.20	136.20
1 1/2	164.40	194.40	224.40
2	282.00	322.20	364.20

SHEET PACKING

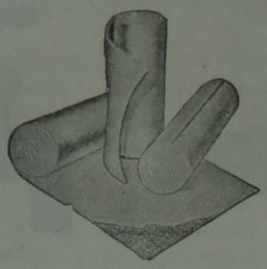


Fig. 3671

CLOTH INSERTION

For steam, water and air. Manufactured in several grades. The best grades present smoothness of finish and are strong, pliable and durable. Thicknesses from 1/32 to 1/4 inch carried in stock. Every 1/16 inch thickness has one ply of cloth. Made one yard wide and any length desired. This packing can also be supplied with iron or brass wire insertion.

Price on Application

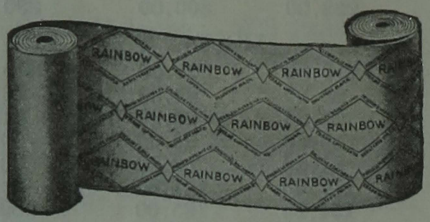


Fig. 3672

RAINBOW

Especially adapted for air, water or steam joints. Will stand any pressure and not squeeze or blow out. Joints should be faced with plumbago, lamp black, or chalk. Joints may be broken any number of times without injury to the packing. Made in 1/32, 1/16, 3/32, 1/8, 3/16 and 1/4 inch thickness; 36 inches wide.

Price on Application

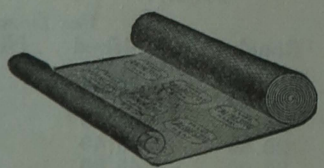


Fig. 3673

ASBESTOS METALLIC

For high pressures and high temperatures. Made of pure asbestos yarn, each strand of warp and filler having two brass wires interwoven to give it strength. Coated with vulcanizing compound; furnished white both sides or one side graphited. 40 inches wide; all thicknesses from 1/16 inch up.

Price on Application

SHEET PACKING

Fig. 3674

BLACK

Can be furnished in several grades, resisting the action of acids, alkalies, ammonia, steam and oil. Can also be furnished self-vulcanizing for steam and expansion joints, between unfinished cast iron flanges, etc. Conforms readily to uneven and rough surfaces. Made 36 inches wide in all grades, any thickness.

Price on Application

PLASTIC METALLIC PACKING

Fig. 3675

SAFETY METALLIC

For steam, water, gas, hydraulic machines, valves, etc. Made of an alloy of antifriction metals combined with the best lubricating material. Makes a practically self-lubricating and frictionless packing. Will stand steam temperatures up to 550°F. and hydraulic pressures up to 5000 pounds per square inch. Practically indestructible and may be removed from stuffing box and used over again repeatedly. Will not wear the rod and is not affected by heat and cold. Packed in bulk for use in lower end of vertical machines or in cotton tubes to fit stuffing boxes.

Price on Application

PISTON ROD PACKING

DANIELS PPP

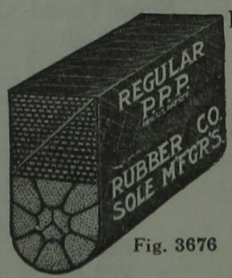


Fig. 3676

Low Pressure

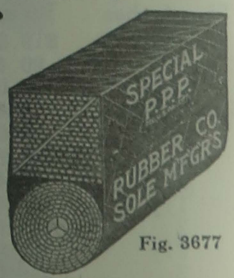


Fig. 3677

High Pressure

Self-lubricating; will not become hard and is not affected by steam, oil, alkalies, acids and sulphurous waters. Low pressure, is suitable for steam up to 100 pounds and for ordinary water pressures, cold or warm, low ammonia pressures, valve stems, etc. High pressure is designed for pressures over 100 pounds. Should not be used in simple condensing engines or for superheated steam. Made from 3/16 to 1 1/4 inches, advancing by 16ths of an inch and from 1 1/4 to 3 inches by 8ths of an inch.

Price on Application

ROD PACKING

RING AND SPIRAL

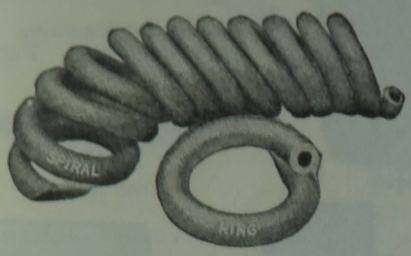


Fig. 3678

ROUND
HIGH PRESSURE—SUPERHEATED STEAM

Made for use on high pressure steam engines, turbines, air compressors, marine and railroad equipment, etc. Will withstand oil, acid and grease. Made of long fibre asbestos fabric with a core of special compound. Made in spiral or ring form, round or square.

Price on Application

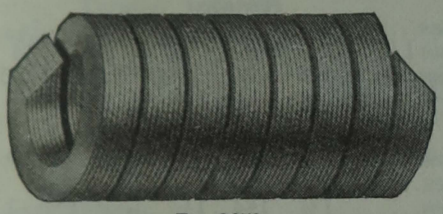


Fig. 3679

SQUARE—FOR LOW STEAM PRESSURE

Made in either ring or spiral form and in all sizes from 1/8 to 2 inches, 12½ to 50 feet long.

Price on Application

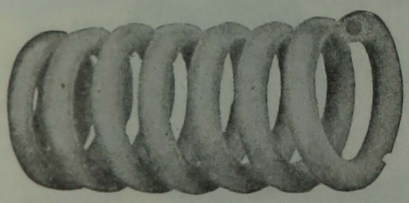


Fig. 3680

ROUND—LOW PRESSURE

Made in either ring or spiral form for low pressures. The core of the packing is surrounded by high quality duck impregnated with graphite. Will not harden or disintegrate under high temperature. Made in sizes from 1/8 to 7/8 inch, advancing by 16ths.

Price on Application

Fig. 3681

SQUARE—LOW PRESSURE

A high grade packing for general use on low pressure work. Will expand easily. Made 3/16 inch and larger

Price on Application

ROD PACKING

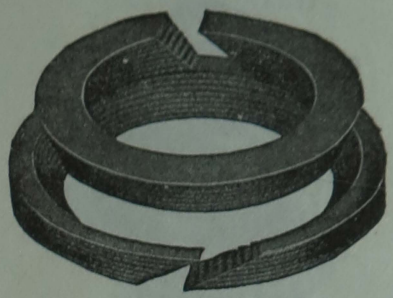


Fig. 3682

SECTIONAL EXPANSION RING

Packing will expand easily. For high or low pressures. Designed for rods badly cut or out of center. Can be made only when rim of packing is half an inch or more in width. Made to order only. State whether single or double is wanted; number of rings; diameter of rod and stuffing box; depth of box and pressure.

Price on Application

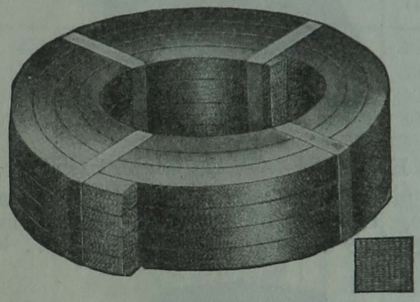


Fig. 3683

TUCK'S SQUARE

Made from best cotton duck and good quality friction; 1/4 inch and larger and in lengths from 12 to 20 feet.

Price on Application

Fig. 3684

HYDRAULIC

Made from fine duck and high quality rubber friction. Suitable for hard work. 1/4 to 2 inches; 12-ft. coils.

Price on Application

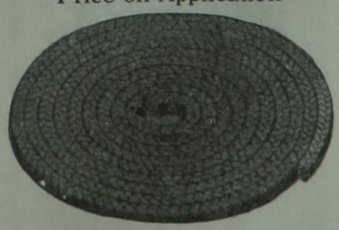


Fig. 3685

SQUARE FLAX—GILT EDGE

Made from the best grade of long fibre flax, braided solid. Well lubricated with a special compound free from grit. Made in 1/4 to 1½ inches.

Price on Application

PACKING

Fig. 3686

SQUARE FLAX

For rods of cold water pumps and elevators. Braided square from flax roving and lubricated with a superior compound. Made in all sizes from ¼ to 2 inches.

Fig. 3687

EUREKA—OVAL GUM CORE

Used on piston rods, valves, etc. For pressures under 100 pounds. Consists of flax, carefully braided over a rectangular piece of rubber well lubricated. 3/16 to 2½ inches.

Fig. 3688

ASBESTOS ROPE

Twisted or Braided

Suitable for the highest pressures and temperatures. Made from pure long fibre asbestos.

Twisted. Made from asbestos yarns, twisted around an asbestos core.

Braided. Made of twisted asbestos rope covered with an asbestos jacket. Sizes larger than ¾-inch have two or more jackets.

Furnished on reels of 10, 25 and 50 pounds.

Fig.3689

ASBESTOS WICK—TWISTED

Made of long pure asbestos fibre and spun into strands which may be separated if desired. Acid and fire proof; strong, soft and flexible. Has no lubrication. Convenient for packing radiator and small valves and valve stems. Furnished in ¼, ½, 1, 2 and 3 pound balls.

All Above, Prices on Application

PACKING

Fig. 3690

CANDLE WICK

Used for caulking purposes, spark plugs, etc. Furnished in 2-ounce balls.

Price on Application

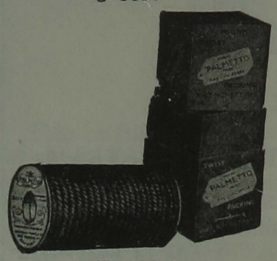


Fig. 3691

Fig. 3692

PALMETTO—SELF-LUBRICATING

For super heated steam, air and ammonia. Made of best material. Will not char or burn and does not harden in service.

Twisted

Size, Inches.....	1/8	3/16	1/4	3/8	7/16	1/2
Feet to One Lb..	120	75	50	23	14	8
One Lb. Spools, $1.00	1.00	1.00	1.00	1.00	1.00	1.00

Furnished on One Pound Spools

Braided—Round or Square

Size, Inches.....	1/4	5/16	3/8	7/16	1/2	9/16	5/8
Size, Inches.....	11/16	3/4	13/16	7/8	15/16	1	1 1/8
Size, Inches.....	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	1 7/8	2
Per Lb.....	$1.00	1.00	1.00	1.00	1.00	1.00	1.00

Furnished in Five Pound Boxes

RUBBER PUMP VALVES

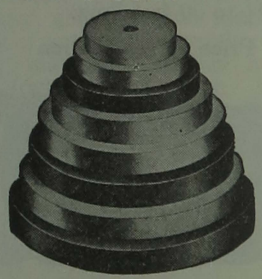


Fig. 3693

Any shape or size, for all styles of pumps. In ordering, state amount of working pressure; minimum and maximum temperature; whether in contact with air, hot or cold water, oils, chemicals, etc.; presence or absence of grit; diameter, thickness and size of hole.

TUBULAR GASKETS

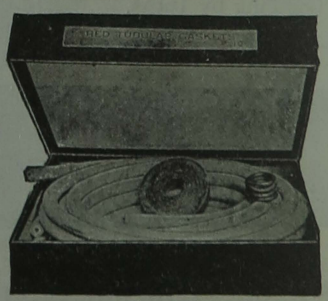


Fig. 3694

For manhole and handhole plates. Will make any size gasket. Made in sizes 3/8, ½, 5/8 and ¾ inches.

Above, Prices on Application

GASKETS

ECLIPSE-SECTIONAL—TUBULAR

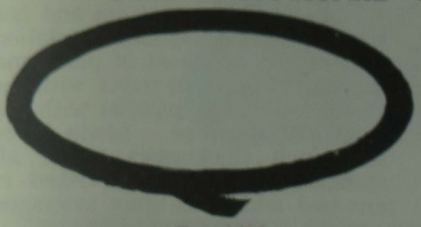


Fig. 3695

Made of high grade packing. Will not harden under any temperature nor blow out under high pressure. Consists of a tube having a central hole its entire length, into which is inserted a soft metal connecting tube, the two butted ends being wrapped with a special tape forming one continuous gasket. Metal tubes and tape furnished with tubing: ¼ and ⅜-inch are for use with pipe unions, ½-inch for handhole plates, ⅝ and ¾-inch for manhole plates and ⅞ and 1 inch for extra large manhole plates.

TUBULAR—METAL INSERTION HIGH PRESSURE

Made of a soft metal-tubular center or core over which is braided asbestos strands covered with fine bronze wire. Treated with a special compound. Pliable, will not harden or crack, burn or blow out. Made in ⅜, ½, ⅝ and ¾ inches, and put up in boxes or on reels.

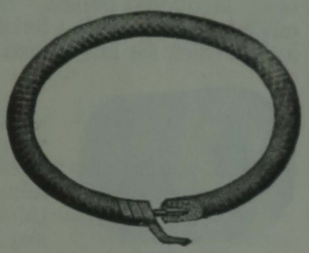


Fig. 3696

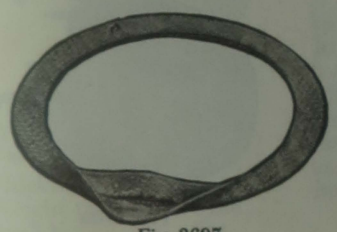


Fig. 3697

METALLIC ASBESTOS

For hand and manholes. Made with fine brass wire insertion. Will stand highest pressure and heat.

FLANGE JOINT—PLAIN ASBESTOS

Fig. 3698

For packing parallel surfaces of flanges against steam, superheated or saturated, air, water, ammonia, oil and chemical solutions.

Cut from sheet packing made of asbestos fibre, bonded with a compound that resists heat, water and chemical solutions. Furnished in 1/64, 1/32 and 1/16 inch thickness. Cut to order.

CLOTH INSERTION

Fig. 3699

Gaskets can be furnished to order made up of cloth insertion, metallic or other packing. One ply of cloth to every 1/16 inch of thickness. Five cents per pound additional will be charged for each extra ply of cloth. The cloth counts as one ply whether as insertion or on the outside. When ordering give inside measurements, width of flange and thickness.

Prices on Application

SOLID COPPER GASKETS

CORRUGATED

Fig. 3700

Prices given are for solid gaskets; the difference between the price of outside and inside diameters will be the price of the required gasket. Thus, the list of an 8-inch gasket is 1.01; the list of a 6-inch is .57; therefore the list on a 6 x 8-inch gasket would be .45 (1.01—.57–.44).

Dia., Ins.	Each	Dia., Ins.	Each	Dia., Ins.	Each	Dia., Ins.	Each
½	$0.004	6	$0.57	18	$5.09	30	$14.14
9/16	.005	6¼	.61	18¼	5.23	30¼	14.37
⅝	.006	6½	.66	18½	5.38	30½	14.61
11/16	.007	6¾	.72	18¾	5.52	30¾	14.85
¾	.009	7	.77	19	5.67	31	15.10
13/16	.01	7¼	.83	19¼	5.82	31¼	15.34
⅞	.012	7½	.88	19½	5.97	31½	15.59
15/16	.014	7¾	.94	19¾	6.13	31¾	15.83
1	.016	8	1.01	20	6.28	32	16.08
1⅛	.02	8¼	1.07	20¼	6.44	32¼	16.34
1¼	.025	8½	1.13	20½	6.60	32½	16.59
1⅜	.03	8¾	1.20	20¾	6.76	32¾	16.85
1½	.035	9	1.27	21	6.93	33	17.11
1⅝	.04	9¼	1.34	21¼	7.09	33¼	17.37
1¾	.05	9½	1.42	21½	7.26	33½	17.63
1⅞	.055	9¾	1.49	21¾	7.43	33¾	17.89
2	.06	10	1.57	22	7.60	34	18.16
2⅛	.07	10¼	1.65	22¼	7.78	34¼	18.43
2¼	.08	10½	1.73	22½	7.95	34½	18.70
2⅜	.09	10¾	1.82	22¾	8.13	34¾	18.97
2½	.10	11	1.90	23	8.31	35	19.24
2⅝	.11	11¼	1.99	23¼	8.49	35¼	19.52
2¾	.12	11½	2.08	23½	8.67	35½	19.80
2⅞	.13	11¾	2.17	23¾	8.86	35¾	20.08
3	.14	12	2.26	24	9.05	36	20.36
3⅛	.15	12¼	2.36	24¼	9.24	36¼	20.64
3¼	.17	12½	2.45	24½	9.43	36½	20.93
3⅜	.18	12¾	2.55	24¾	9.62	36¾	21.21
3½	.19	13	2.65	25	9.82	37	21.50
3⅝	.21	13¼	2.76	25¼	10.01	37¼	21.80
3¾	.22	13½	2.86	25½	10.21	37½	22.09
3⅞	.24	13¾	2.97	25¾	10.42	37¾	22.30
4	.25	14	3.08	26	10.62	38	22.68
4⅛	.27	14¼	3.19	26¼	10.82	38¼	22.98
4¼	.28	14½	3.30	26½	11.03	38½	23.28
4⅜	.30	14¾	3.48	26¾	11.24	38¾	23.59
4½	.32	15	3.53	27	11.45	39	23.89
4⅝	.34	15¼	3.65	27¼	11.66	39¼	24.20
4¾	.35	15½	3.77	27½	11.88	39½	24.51
4⅞	.37	15¾	3.90	27¾	12.10	39¾	24.82
5	.39	16	4.02	28	12.32	40	25.13
5⅛	.41	16¼	4.15	28¼	12.54	40¼	25.45
5¼	.43	16½	4.28	28½	12.76	40½	25.77
5⅜	.45	16¾	4.41	28¾	12.98	40¾	26.08
5½	.48	17	4.54	29	13.21	41	26.41
5⅝	.50	17¼	4.67	29¼	13.44	41¼	26.73
5¾	.52	17½	4.81	29½	13.67	41½	27.05
5⅞	.54	17¾	4.95	29¾	13.90	41¾	27.38

Prices of elliptical and rectangular gaskets upon application.

GASKET AND WASHER CUTTERS

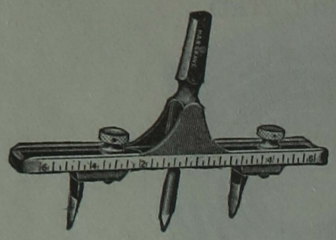


Fig. 3701

Used for cutting washers and gaskets out of leather, paper, rubber, sheet lead and thin wood. Cuts outer and inner circle at same time. Will fit ordinary brace. Body of malleable iron; pin of steel and the blades of best tool steel properly ground and tempered. Adjustment is made by knurled thumb screw; japanned finish, polished, scaled sides.

NOS.	Cuts Diam., Inches	Weight Per Dozen, Lbs.	With Gauge, Per Dozen	Without Gauge, Per Dozen	Knives, Per Dozen	Screws, Per Dozen
405	4	7½	$18.00	....	$5.00	$2.00
406	4	7½	....	$15.00	5.00	2.00
407	6	8	21.00	....	5.00	2.00
408	6	8	....	18.00	5.00	2.00

One-half Dozen in a Box

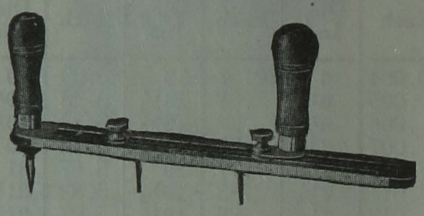


Fig. 3702

Cuts gaskets from 4 to 20 inches in diameter. Knives are of the best steel, well tempered and adjusted by knurled thumb screws; center pin is of steel; furnished with gauge; japanned and polished.

NO.	Cuts Diam., Inches	Weight Per Dozen, Lbs.	Per Dozen	Knives, Per Dozen	Screws, Per Dozen
411	20	15	$30.00	$5.00	$2.00

One-quarter Dozen in a Box

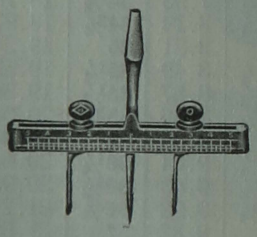


Fig. 3703

Cuts gaskets from ½ to 5 inches. Has hammered steel blades; graduated scale and is nicely polished.

Per Dozen

NO. 21—Capacity, ½ to 5 Inches; Weight per Dozen, 5⅞ Lbs..$16.00

Has malleable body with finely tempered steel knives. Nicely polished.

Per Dozen

NO. 122—Capacity, ½ to 4½ Inches; Weight per Doz., 5½ Lbs.....$15.00

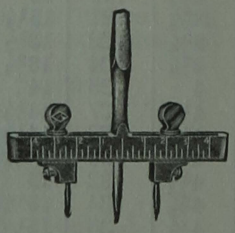


Fig. 3704

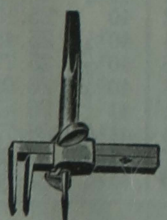


Fig. 3705

Penny's pattern. Not graduated. Knives made of best steel; adjusted by means of two thumb screws; polished.

Per Dozen

NO. 124—Capacity, ½ to 5 Inches; Weight per Dozen, 5¾ Lbs. ..$14.00

All, One-half Dozen in a Box

PIPE INSULATIONS

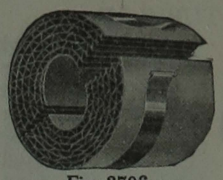


Fig. 3706

AIR CELL

For low pressure steam and hot water pipes. A cellular insulation constructed of layers of plain and corrugated asbestos paper with the channels running parallel with the length of the pipe. Made in ½ to 3 inch thicknesses to fit all standard size pipes. Furnished in three foot sections canvased and with brass lacquered bands. Can also be supplied in sheets and blocks.

85 PER CENT MAGNESIA

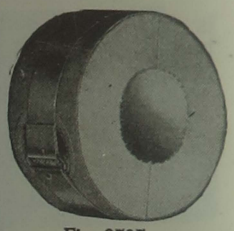


Fig. 3707

For high pressure and superheated steam pipes. Combines the high non-conducting qualities of carbonate of magnesia and asbestos in a light highly efficient insulation. Made in 1 to 3 inch thickness; 3-foot section to fit standard pipes ½ to 14 inches. Supplied with brass lacquered bands. Is furnished also in blocks 3x18 inches or 6x36 inches, ½ to 4 inches thick for larger size pipe.

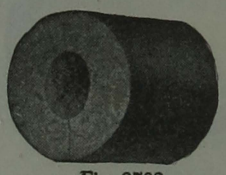


Fig. 3708

WOOL FELT

For low pressure steam and hot water heating systems. Made of wool felt and lined with asbestos felt. Furnished ½, ¾ and 1 inch thick; 3-foot sections for all standard size of pipe. Brass lacquered bands.

ANTI-SWEAT

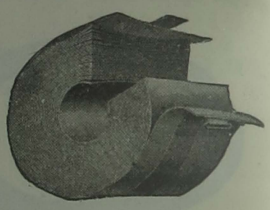


Fig. 3709

To prevent condensation of cold water pipes. Made of water proof insulating paper and wool felt securely stitched together. Furnished in ½, ¾ and 1 inch thickness; 3-foot sections with canvas jacket and brass lacquered bands.

Inside Diam. Pipe, Inches	Standard Thickness Up to 1 In., Per Lineal Foot	1½-Ins. Thick, Per Lineal Foot	2-Ins. Thick, Per Lineal Foot	Double Thick, Per Lineal Foot	3-Ins. Broken Joints, Each
½	$0.22	$0.46	$0.75	$0.65	$1.20
¾	.24	.49	.80	.70	1.35
1	.27	.52	.85	.75	1.40
1¼	.30	.56	.90	.80	1.45
1½	.33	.60	.95	.85	1.55
2	.36	.64	1.00	.90	1.65
2½	.40	.70	1.05	1.00	1.75
3	.45	.76	1.15	1.10	1.90
3½	.50	.82	1.25	1.20	2.05
4	.60	.88	1.35	1.40	2.20
4½	.65	.94	1.45	1.50	2.35
5	.70	1.00	1.55	1.60	2.50
6	.80	1.10	1.70	1.80	2.70
7	1.00	1.20	1.85	2.25	2.90
8	1.10	1.35	2.00	2.50	3.15
9	1.20	1.50	2.20	2.70	3.40
10	1.30	1.65	2.40	2.90	3.65
12	1.85	1.85	2.70	4.10	4.10
14	2.10	2.10	3.00	4.60	4.60
16	2.35	2.35	3.34	5.10	5.10
18	2.60	2.60	3.60	5.60	5.60
20	2.85	2.85	4.00	6.00	6.00
24	3.30	3.30	4.50	7.00	7.00
30	4.00	4.00	5.50	8.40	8.40

Air-Cell, 85° Magnesia, Sponge Felt and Fire Felt can be supplied in sheets and blocks from ½ to 4 inches thick.

HAIR FELT

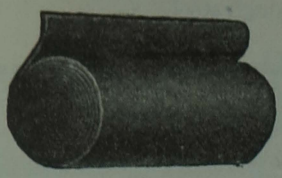


Fig. 3710

Used for lining refrigerators, refrigerator-cars, ice houses, etc., and is also used for insulating hot water pipes or for the protection of cold water pipes against freezing. Made of selected cattle hair by improved felting process. Put up in bales 6 feet wide containing 300 square feet. Can also be furnished 3 feet wide at the same price.

Thickness, Inches	1/4	1/2	3/4
Weight per Square Foot, Ounces	4	6	9
Weight per Bale, Lbs.	75	112½	170
Per Square Foot	$0.05½	.06½	.08½
Thickness, Inches	1	1½	2
Weight per Square Foot, Ounces	12	18	23
Weight per Bale, Lbs.	225	337	450
Per Square Foot	$0.10	.15	.19

ASBESTOS MILL BOARD

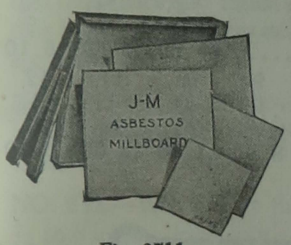


Fig. 3711

Made of asbestos fibre and a suitable binder for protection against heat acid fumes, fire, etc. Used for lining doors, floors, etc., in mills, factories and power-plants. Made in 3 grades: hard, medium and soft. Standard sheets, 40x 40 and 42x42 inches.

Thickness, Inches	1/32	3/64	1/16	5/64
Weight per Sheet, Lbs.	3	3.1	3.75	5.1
Per Lb.	....	...	...	...
Thickness, Inches	3/32	1/8	5/32	3/16
Weight per Sheet, Lbs.	6	7	9	10
Per Lb.	....	...	...	...
Thickness, Inches	1/4	5/16	3/8	1/2
Weight per Sheet, Lbs.	14	17	20	25
Per Lb.	....	...	...	...

ASBESTOS PAPER

Made of long fibre asbestos. Its use is large and varied especially as a fire retardant.

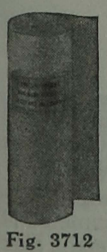


Fig. 3712

Thickness, Inches	.015	.018	.020
Wt. per 100 Sq. Ft., Lbs.	6	8	10
Per Lb.	....	...	...
Thickness, Inches	.025	.028	1/32
Wt per 100 Sq. Ft., Lbs.	12	14	16
Per Lb.	....	...	...
Thickness, Inches	1/16	3/32	1/8
Wt. per 100 Sq. Ft., Lbs.	38	53	68
Per Lb.	....	...	...

Fig. 3713

MINERAL WOOL

For fireproofing and cold storage insulation. Made from clean long staple material and free from sulphur. Weighs about 12 Lbs. per cubic foot.

	Per Pound
In 60 Lbs. Sacks	$.....

Prices of Above on Application

ASBESTOS CEMENT

Fig. 3714

For finishing over sheets and blocks and for insulating large heating surfaces and fittings. Easy to mix and readily sticks to hot surfaces. It is furnished with a hard, durable and attractive surface that will not crack, break or peel off. Hot blast cement is recommended for covering steam surfaces that are liable to become red hot.

Fire Felt will cover approximately 30 square feet, 1 inch thick per 100 pounds; 85 per cent Magnesia, 60 pounds to the bag, will cover approximately 35 square feet, 1 inch thick. Standard asbestos, 100 pounds to the bag, will cover approximately 25 square feet, 1 inch thick.

Prices on Application

		Per Bag
Standard Cement Felting	100 Lb. Bag	....
Standard Cement Felting	120 Lb. Bag	....
Asbestos Fire Felt	100 Lb. Bag	....
Asbestos Hot Blast	140 Lb. Bag	....
85 Per Cent Magnesia	60 Lb. Bag	....

FLAKE GRAPHITE

Useful for gas and steam engines, air compressors, etc. Also excellent for coating packings, gaskets, pipe fittings, etc. Made in No. 1 flake (coarse) and No. 2 flake (fine).

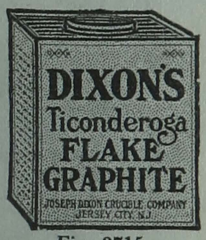


Fig. 3715

Size Cans, Lbs.	1	5	10
Per Can	$0.50	2.00	4.00

Can also be furnished in 25 and 50 Lb. boxes, kegs and barrels.

PIPE JOINT COMPOUND

Fig. 3716

Will make tight joints, threaded or flanged; on water, gas, oil, brine and air piping. Prevents rust and corrosion. Will not harden and allows joints to be opened easily any time.

Size Cans, Lbs.	1	5	10
Per Lb.	$0.40	.36	.30

Can also be furnished in 25 lb. pails, kegs and barrels.

LUBRICATING GREASE

ALBANY

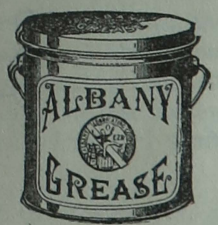


Fig. 3717

A pure lubricant; does not drip, splash or waste away. Runs only while shaft is in motion. Impossible for bearings to become overheated. No drip pans required. Will feed perfectly through any grease cup, and can be used under varying conditions. It is made in one quality only, but in seven different consistencies; for cold temperatures, soft grease is to be used; for hot, hard grease. Furnished in seven consistencies and numbered as follows:

Soft numbers, 0-1; medium numbers, 2-3; hard numbers, X, XX, XXX.

Size Cans, Lbs.	1	5	10	25
Per Can	$0.25	1.00	2.00	5.00

Can also furnish 50-pound cans, kegs, half barrels and barrels.

SCRAPING TOOLS

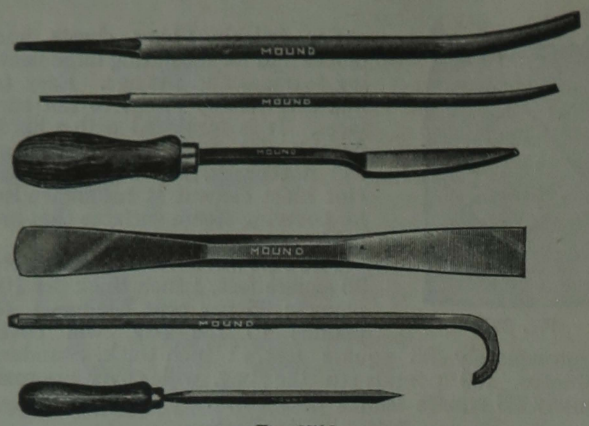


Fig. 3718

Made of best tool steel carefully forged, tempered and hollow ground. For scraping bearings, bushings and for oil grooves, etc. Put up in an oak case with metal holders for each tool.

Per Set

NO. 22—6 Tools, 6 to 10 Inches; Weight per Set, 4¼ Lbs..... $3.00

NO. 2—6 Tools, 8 to 14 Inches; Weight per Set 4½ Lbs..... 3.50

PACKING TOOLS

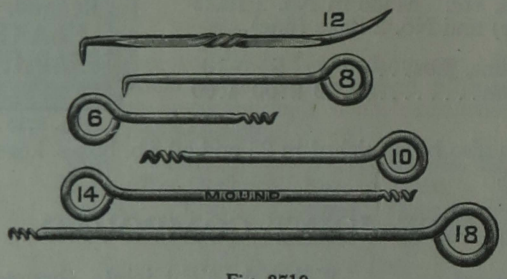


Fig. 3719

Made of special tool steel finely nickel plated. Will not break in removing packing from stuffing boxes of engines pumps, etc.

Per Set

NO. 1—4 Toos, Nos. 6, 10, 12 and 14; Weight per Set, ¾ Lbs..... $1.50

NO. 2—6 Tools, Nos. 6, 8, 10, 12, 14, 18; Weight per Set, 1¼ Lbs..... 2.25

Small sizes, 3/16-inch steel; medium, ¼-inch; large, 5/16-inch.

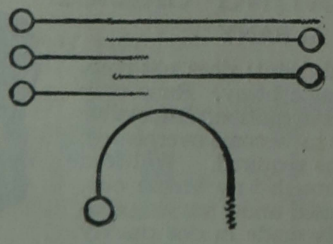


Fig. 3720

LIGHTNING

Made of fine steel, nicely nickel plated. Strong and flexible and can be used in any stuffing box. A set includes two 6-inch tools for ¼ and ⅜-inch boxes; two 12-inch tools of heavy steel; one 18-inch tool, also of heavy steel and one picker.

Per Set

NO. 11—One set, 6 Tools; Weight per Set, 2½ Lbs. $2.90

FIRING TOOLS

Made of soft tough steel.

Fig. 3721

HOES

Length, Feet			5	6	7
Diameter Handle, Inches			¾	¾	¾
Weight Each, Lbs.			7	8	9
Each			$4.60	5.00	5.50
Length, Feet	8	9	10	11	12
Diameter Handle, Inches	⅞	⅞	1	1	1⅛
Weight Each, Lbs.	12	13	22	26	30
Each	$7.20	8.00	10.00	11.20	15.00

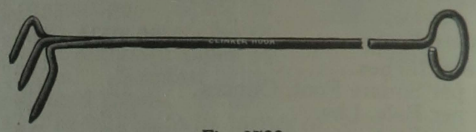


Fig. 3722

CLINKER HOOKS

Length, Feet			5	6	7
Diameter Handle, Inches			¾	¾	¾
Weight Each, Lbs.			6½	7¾	9
Each			$5.20	5.60	6.10
Length, Feet	8	9	10	11	12
Diameter Handle, Inches	⅞	⅞	1	1	1⅛
Weight Each, Lbs.	12	16	22	26	30
Each	$8.00	8.80	11.00	12.00	16.00

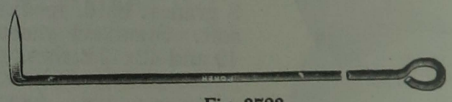


Fig. 3723

POKERS

Length, Feet			5	6	7
Diameter Handle, Inches			¾	¾	¾
Weight Each, Lbs.			4	5	8
Each			$3.40	3.80	4.20
Length, Feet	8	9	10	11	12
Diameter Handle, Inches	⅞	⅞	1	1	1⅛
Weight Each, Lbs.	12	15	20	24	26
Each	$5.40	5.80	7.50	8.00	10.40

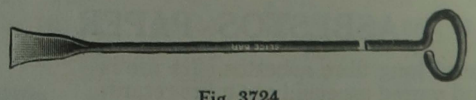


Fig. 3724

SLICE BARS

Length, Feet			5	6	7
Diameter Handle, Inches			¾	¾	¾
Weight Each, Lbs.			4	5	7
Each			$4.20	4.60	5.10
Length, Feet	8	9	10	11	12
Diameter Handle, Inches	⅞	⅞	1	1	1⅛
Weight Each, Lbs.	10	12	20	24	26
Each	$6.50	7.20	9.00	10.00	13.00

GRATE BARS

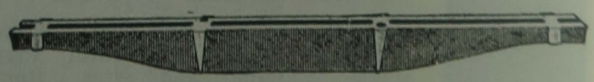


Fig. 3725

We are in a position to furnish all kinds of grate bars such as: Common, Light, Medium and Heavy Pattern, Adams, Tupper and Round Styles.

Prices on Application

GLOBE VALVE RESEATING MACHINES

DEXTER

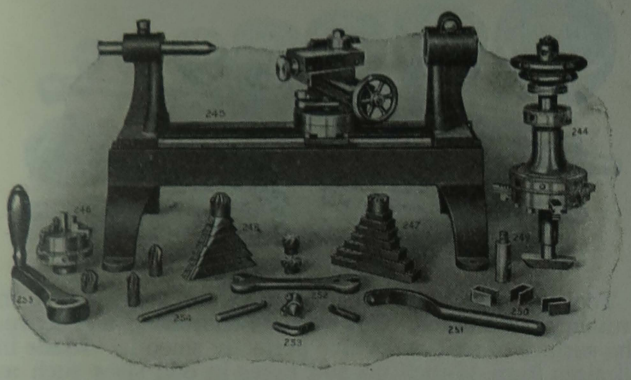


Fig. 3726

NO. 3TL

Machines are positive in operation. They true up a worn valve seat and its disc exactly alike, making a perfectly tight seat for water or steam. Valves can be made as good as new and reseated in from 10 to 20 minutes. Has universal chuck for attaching to valve. The jaws of the machine are simultaneously adjusted to valve casing by rotating the scroll of the chuck. A bearing sleeve supports the tool spindle practically its entire length, which strengthens tool shaft and keeps it perfectly aligned. Bearing sleeve with tool shaft slides through the chuck and with cutter attached is instantly lowered to valve seat. Machines may be securely attached to valves having threads on the outside of body as well as to valves threaded on the inside and also to flanged cap valves.

NO. 3TL—For reseating flat and taper seated valves, ¼ to 3 inches inclusive. Outfit includes valve reseating machine; ten steel cutters for flat and ten for taper seats; one turret disc cutting machine which will cut flat, taper and oval discs and those with radial wings and projections; disc holding chuck; extension spindles; set of recess cutters, spanners, etc.

NO. 4TL—Same as above, but will reseat valves from ¼ to 4 inches inclusive and has 12 cutters each, for flat and taper discs.

NO. 6TL—Will reseat flat and taper seated valves from ¼ to 6 inches, inclusive. Outfit includes two valve reseating machines with 15 steel cutters each for flat and taper seats, one turret valve disc cutting machine and other tools as listed above.

Packed in polished case with tray for cutters

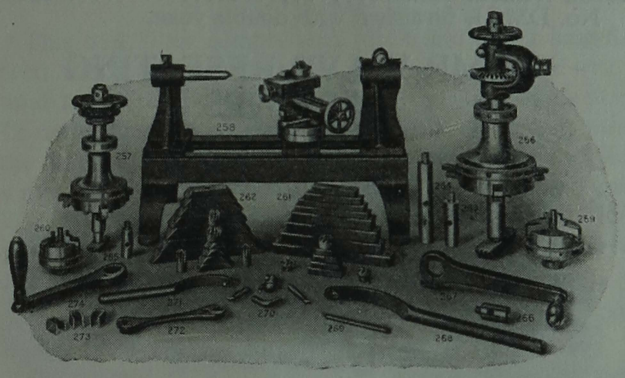


Fig. 3727

NO. 6TL

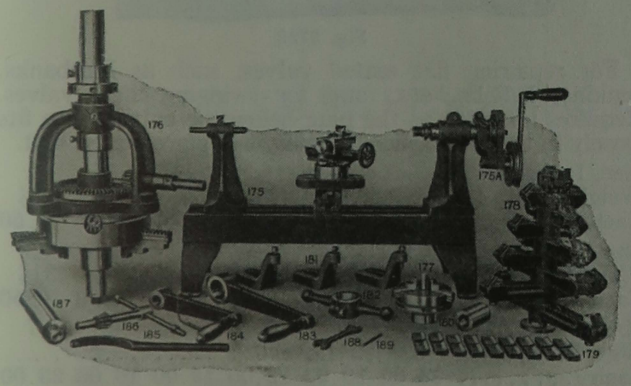


Fig. 3728

NO. 12TL

NO. 8TL—Will reseat flat and taper seated valves from ¼ to 8 inches. Outfit includes two valve reseating machines with complete set of cutters for recutting flat and taper valve seats, one turret disc cutting machine, two disc holding chucks, set of recess cutters, etc.

NO. 10TL—A size larger than No. 8TL outfit, furnished complete for recutting all flat and taper valve seats and their discs from ¼ to 10 inches inclusive.

NO. 12TL—A complete outfit for reseating all flat and taper seated valves, ¼ to 12 inch inclusive. Outfit consists of two patent valve reseating machines; a complete set of cutters, turret disc cutting machine, two disc holding chucks, set of recess cutters, extensions to tool shaft, spanners, etc.

Packed in two polished cases with tray for cutters.

NOS.	3TL	4TL	6TL	8TL	10TL	12TL
Capacity, Inches	¼–3	¼–4	¼–6	¼–8	¼–10	¼–12
Weight Each, Lbs.	63	68	106	216	236	355
Each, with Turret Disc Cutter	**$109.38**	**128.13**	**171.88**	**234.38**	**328.13**	**421.88**
Each, with Dexter Disc Cutter	**93.75**	**112.50**	**156.25**	**218.75**	**312.50**	**406.25**

For special set of cutters ¼ to 3 inches for recutting seat of Fairbanks Valves oval, add $25.00 to price of outfit.

PUMP VALVE ATTACHMENTS
FOR DEXTER GLOBE VALVE RESEATING MACHINES

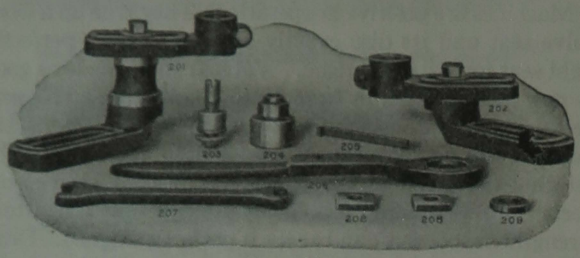


Fig. 3729

OUTFIT NO. DM6

When used with S & W pump cutters these attachments will enable owners of Dexter Globe Valve Reseating Machines to reface the seats of all pump valves of standard makes of pumps.

NO.	DM6
Cutter Carrying Cap. Inches	2–7½
For Reseating Machines, No.	6
Weight Each, Lbs.	21
Each, Without Cutters	**$30.00**

No. DM6 is furnished with double yoke.

PUMP VALVE RESEATING MACHINES
DEXTER

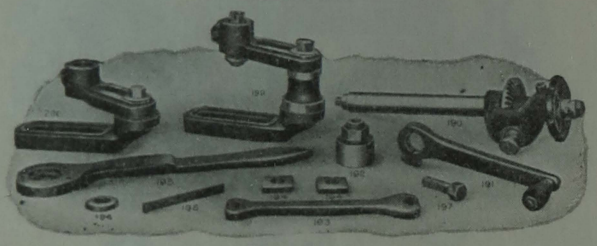


Fig. 3730

OUTFIT NO. DH6

Can be quickly attached for recutting the seats in the water valve chamber of all types of duplex, triplex and single cylinder, plunger, boiler feed, vacuum, mine and general service pumps.

The valve seat is accurately recut in a few minutes, making an absolutely tight valve. The yoke is bolted or clamped to studs on valve chamber, after which the handle is given a few turns at the same time the feed wheel is turned slowly. The cutters are self-leveling and do not chatter. Cutter and ratchet with valve stem for fulcrum and feed is used for refacing valve seats located where it is impossible to use tool shaft bearing sleeve and yoke.

All outfits are used independently of the Dexter Globe Valve Reseating Lachines.

NOS.	DH6	N15
Capacity, Inches	2–7½	8–15
Weight Each, Lbs.	35	65
Each, Without Cutters	**$46.25**	**81.25**

No. DH6 is furnished with double yoke.

Each outfit packed in polished case.

S & W PATENT VALVE CUTTERS

For refacing pump valve seats, used with Dexter Globe and Pump Valve Reseating Machines and Pump Attachments.

Size, Inches	2	2½	3	3½	4
Weight Each, Lbs.	½	¾	1½	1¾	3
Each	**$15.00**	**15.00**	**15.00**	**18.75**	**18.75**
Size, Inches	4½	5	5½	6	6½	7
Wgt. Each, Lbs.	3⅛	3¼	3½	3¾	3⅞	4
Each	**$18.75**	**22.50**	**22.50**	**22.50**	**27.50**	**27.50**
Size, Inches	7½	8	10	12	14	15
Wgt. Each, Lbs.	4	20	33	49	60	73
Each	**$27.50**	**37.50**	**62.50**	**81.25**	**93.75**	**100.00**

When ordering cutters, give pump valve bolt for each cutter.

GLOBE VALVE RESEATING TOOLS
DRAPER

Fig. 3731

Tools are made with spherical faces and are for use in an ordinary hand brace. Cut without chattering and leaves the surface of seat and valve perfectly smooth. Made in all sizes from ¼-inch up and takes in odd sizes such as water column valves, lubricating valves, and drip and relief valves; also for repairing seats of hydraulic pumps for which the greatest accuracy must exist.

Size, Inches	¼	⅜	½	¾	1
Weight Each, Lbs.	¼	⅓	⅓	½	¾
Each	**$1.75**	**2.00**	**2.50**	**3.00**	**3.50**
Size, Inches	1¼	1½	2	2½	3
Weight Each, Lbs.	⅞	1⅛	2½	4	5⅓
Each	**$4.25**	**5.00**	**6.00**	**7.50**	**10.00**
Size, Inches	3½	4	4½	5	6	7
Wgt. Each, Lbs.	8	11	....	....	....	....
Each	**$12.50**	**15.00**	**17.50**	**20.00**	**25.00**	**35.00**

IN SETS

Per Set

NO. 142—Sizes, ¼ to 2 Inch, Inc.; Weight per Set, 8 Lbs. **$25.00**

FLAT SEAT VALVE RESEATING TOOLS

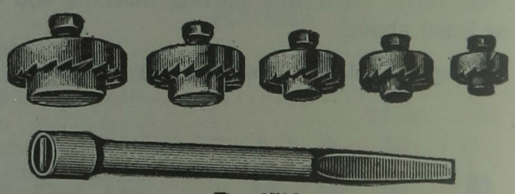


Fig. 3732

For repairing flat seated valves, such as Fairbanks, Jenkins, L.R.D., etc., and for swinging check valves. Requires no guide as the plug below the cutting face fits loosely in the seat orifice, keeping it in place on the seat.

Size, Inches	¼	⅜	½	¾	1
Weight Each, Lbs.	1/5	¼	¼	⅜	½
Each	**$1.00**	**1.25**	**1.50**	**2.00**	**2.50**
Size, Inches	1¼	1½	2	2½	3
Weight Each, Lbs.	⅝	1 1/16	⅞	2¾	3⅞
Each	**$3.00**	**3.75**	**4.50**	**5.50**	**6.50**
Size, Inches	3½	4	4½	5	6	7
Wgt. Each, Lbs.	6	....	....	....	....	....
Each	**$8.00**	**10.00**	**12.00**	**15.00**	**18.00**	**23.00**

IN SETS

Per Set

NO. 142FS—Size, ¼ to 2 Inch, Inc.; Weight per Set, 6 Lbs. **$18.00**

WATER TAP FACERS

Size, Inches	⅜	½	⅝	¾
Weight Each, Ounces	3	3¼	3½	3¾
Each	**$1.25**	**1.50**	**1.75**	**2.00**

SPECIAL VALVE RESEATING TOOLS

Tools can be supplied for safety valves, gauge valves, injector valves, raised seat valves, etc.

Send Particulars for Prices

VALVE RESEATING TOOLS

SKINNER

Fig. 3733

Consists of a spindle, a taper bushing, a cutter holder and a shear cutter. The outfit is made of high grade steel accurately machined and brought to a smooth polish—special attention being given to the cutters, which are skillfully hardened and tempered. They embody the well-known principle of "shear-cut." Cannot chatter, have keen cutting edges, and ample clearance. The seat is not ground but cut smoothly and accurately.

By using the valve bonnet in connection with the taper bushing as a guide at the top, and the round cutter holder in the seat opening as a guide at the bottom, alignment is inevitable.

The same cutter can be used on taper or flat seats by reversing.

Very little pressure is needed to do a good job and ordinarily a valve may be reseated ten to twenty times. No skilled labor is necessary.

Outfit is packed in a polished hardwood case with full directions.

NOS.	1	2
Complete for Valves, Inches	½ to 2	½ to 3
Weight per Set, Lbs.	8	12
Per Set	$20.00	30.00

MOTOR VALVE RESEATERS

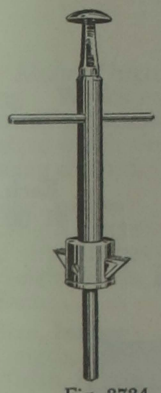


Fig. 3734

For reseating automobile, marine and stationary engine valves. Has same shear cutters as tool described above. Four cutters and four pilots supplied. Will reseat with perfect alignment all styles and combinations of valve seats from 1¼ to 2½ inches.

NO.	1
Weight Each, Lbs.	4
Each	$12.50
Extra Cutters, Each	1.75

Packed in polished hardwood case.

BIBB RESEATERS

SKINNER

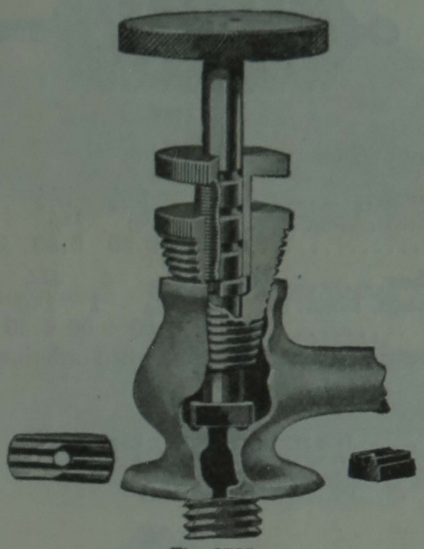


Fig. 3735

This tool is for compression bibbs and fills a long-felt need, for by the use of a thread feed the one trouble with a small radius cutter, that is, chattering, has been eliminated. To use: simply slip off the bonnet of the leaky faucet, insert the tool—fitted with the proper cutter—turn the feed screw down until the cutter rests lightly on the bibb seat. Wheel is then turned steadily, and the cutter is forced down slowly, with occasional slight twists of the feed screw.

The seat is cut without removing the faucet from its place. The thread feed and the bar cutters make it possible for anyone to get perfect results.

The outfit complete with three cutters for bibbs from ⅜ inch to ¾ inch is packed in a neat, strong canvas bag, and can be carried in the pocket. Made of steel and nicely finished.

NO.	1
Weight Each, Lb.	1
Each	$2.50

VALVE DISCS

PERFECT

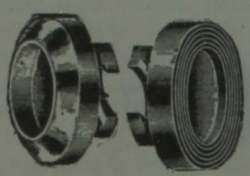
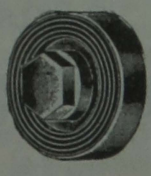


Fig. 3736
Fairbanks Style



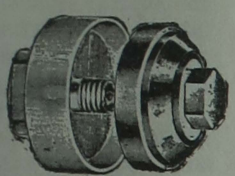


Fig. 3737
Jenkins Style

Made of brass composition, soft enough to take the wear away from the seat but hard enough to outlast many composition discs. Made to fit Fairbanks, Jenkins, and Pratt and Cady valves. Made either flat or taper with limited contact surface.

Size, Inches	½	¾	1	1¼
Fairbanks, Each	$0.30	.35	.45	.60
Jenkins, Each	.25	.30	.35	.45

Size, Inches	1½	2	2½	3
Fairbanks, Each	$0.75	1.00	1.50	2.00
Jenkins, Each	.60	.75	1.25	1.75

SPIRAL FLUE BRUSHES

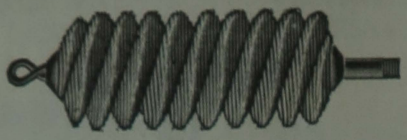


Fig. 3738

Made of stiff tempered steel wire.

Size, Inches	1-2	2¼	2½	2¾	3
Weight Each, Lbs.	8/16	9/16	10/16	11/16	12/16
Each	$2.00	2.25	2.50	2.75	3.00

Size, Inches	3¼	3½	4	4½	5	6
Weight Each, Lbs.	13/16	14/16	1	1 2/16	1 4/16	1 8/16
Each	$3.25	3.50	4.00	4.50	5.00	6.00

State outside diameter of tube when ordering.

TUBE SCRAPERS

INGALLS

Fig. 3739

The spring is tempered after being wound. Never set or wears out. The shell that covers the spring is pressed steel. Spindle is full size the entire length. The scraping edges are hardened and are very effective on scale.

Size, Inches	1½	2	2¼	2½
Weight Each, Lbs.	15/16	1 2/16	1 6/16	1 10/16
Each	$2.00	2.00	2.25	2.50

Size, Inches	2¾	3	3¼	3½
Weight Each, Lbs.	1 11/16	1 14/16	2	2 4/16
Each	$2.75	3.00	3.25	3.50

Size, Inches	3¾	4	4½	5
Weight Each, Lbs.	2 5/16	2 8/16	2 11/16	3 2/16
Each	$3.75	4.00	4.50	5.00

State outside diameter of tube when ordering.

COMBINATION SCRAPERS AND BRUSHES

INGALLS

Fig. 3740

Similar in construction to above, but fitted with a fine wire brush. The brush cleans out the scale loosened by the cutting edges.

Size, Inches	1½	2	2¼	2½
Weight Each, Lbs.	1 5/8	2 1/8	2 1/4	2 3/8
Each	$2.50	2.50	2.85	3.15

Size, Inches	2¾	3	3¼	3½
Weight Each, Lbs.	2 5/8	3	3 1/8	3 3/8
Each	$3.45	3.75	4.10	4.40

Size, Inches	3¾	4	4½	5
Weight Each, Lbs.	3 7/8	4 1/8	4 1/2	5 1/8
Each	$4.70	5.00	5.65	6.25

State outside diameter of tube when ordering.

TUBE CLEANER RODS

BUTMAN

Made of white ash, 1½ inches in diameter. Has sockets and joints of malleable iron and is fitted with connecting balls of steel. The socket on the first section of rods is tapped for ⅜-inch pipe. Will fit any style brush or scraper.

Fig. 3741

Class A

NOS.	1	2	3
Length 1st Section, Feet	6½	5½	4½
Length 2nd Section, Feet	6½	5½	4½
Over All, Feet	13	11	9
Weight Each, Lbs.	10	8	7
Each	$5.76	5.60	5.44

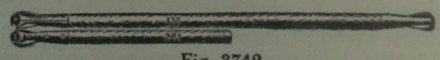


Fig. 3742

Class B

Recommended for use where there is plenty of room in front of the boiler.

NOS.	4	5	6	7	8
Length 1st Section, Feet	15	13	11	10	8
Length 2nd Section, Feet	6	6	6	5	5
Over All, Feet	21	19	17	15	13
Weight Each, Lbs.	11½	11	10	10	9
Each	$6.40	6.24	6.08	5.90	5.76

Fig. 3743

Class C

NOS.	9	10	11	12
Length 1st Section, Feet	7	6 1/3	5 2/3	5
Length 2nd Section, Feet	7	6 1/3	5 2/3	5
Length 3rd Section, Feet	7	6 1/3	5 2/3	5
Over All, Feet	21	19	17	15
Weight Each, Lbs.	16	15½	14	13
Each	$8.40	8.24	8.08	7.96

NOS.	13	14	15
Length 1st Section, Feet	4 1/3	3 2/3	3
Length 2nd Section, Feet	4 1/3	3 2/3	3
Length 3rd Section, Feet	4 1/3	3 2/3	3
Over All, Feet	13	11	9
Weight Each, Lbs.	12½	11	10
Each	$7.76	7.60	7.42

FLUE ROD SOCKETS

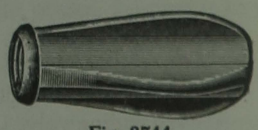


Fig. 3744

Tapped for ⅜-inch flue scrapers.	Each
Weight Each, ¾ Lb.	$1.00

FLUE ROD JOINTS

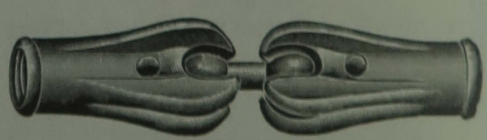


Fig. 3745

Tapped for ¾-inch pipe. By the use of flue rod joints and sockets, anyone can make up a flue rod to fit any use.

	Each
Weight Each, ¼ Lb.	$1.50

BOILER TUBE CLEANERS

Fig. 3746

ELLIPTICAL SCRAPER

Well made of steel. Can be expanded or contracted. The center rod is very heavy and other parts are strong. Has spring placed on back end of scraper, as with this method not much room is required at the rear of the boiler to allow the scraper to clear the tubes.

Size, Inches	1-2	2¼	2½	2¾
Weight Each, Lbs.	1½	2	2¼	2½
Each	$2.00	2.25	2.50	2.75

Size, Inches	3	3¼	3½	3¾	4
Weight Each, Lbs.	2⅝	2¾	2⅞	3	3¼
Each	$3.00	3.25	3.50	3.75	4.00

Over 4 inches, $1.00 per inch.

State outside diameter of tubes, when ordering.

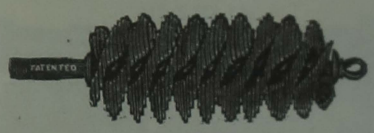


Fig. 3747

COIL BRUSH AND SCRAPER COMBINED

Made of specially tempered spring steel wire, strong, elastic and durable. Also made with bronze wire for creamery use.

Size, Inches	¾-2	2¼	2½	2¾
Weight Each, Lbs.	5/16	9/16	10/16	11/16
Each	$2.00	2.25	2.50	2.75

Size, Inches	3	3¼	3½	3¾	4
Weight Each, Lbs.	1 2/16	1 3/16	1 4/16	1 5/16	1
Each	$3.00	3.25	3.50	3.75	4.00

State outside diameter of tubes when ordering.

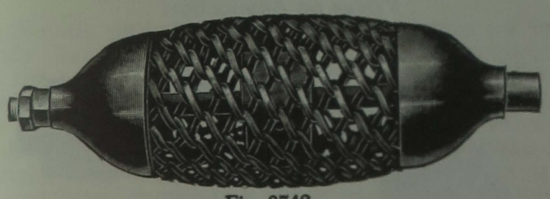


Fig. 3748

CRISS-CROSS

Made of high carbon steel wire; flexible and self-conforming. Works equally well in both directions; requires no brush attachment. Has a very large number of cutting edges which work at right angles to the surface of the tube being cleaned.

Size, Inches	1¼	1½	1¾	2	2¼
Length, Inches	8	8	8¼	8¼	8⅜
Width, Inches	1	1¼	1½	1¾	2
Weight Each, Lbs.	5/16	1	1	1½	2
Each	$2.00	2.00	2.00	2.00	2.25

Size, Inches	2½	2¾	3	3¼	3½
Length, Inches	8⅜	10⅛	10⅛	10¼	10½
Width, Inches	2¼	2½	2¾	3	3¼
Weight Each, Lbs.	2	3	3	3¾	3¾
Each	$2.50	2.75	3.00	3.25	3.50

Size, Inches	3¾	4	4½	5	6
Length, Inches	10½	10½	11¼	14	15
Width, Inches	3½	3¾	4½	4¾	5¾
Weight Each, Lbs.	4	4½	5½	6	7
Each	$3.75	4.00	4.50	5.00	6.00

State outside diameter of tubes, when ordering.

BOILER TUBE CLEANERS

DEAN

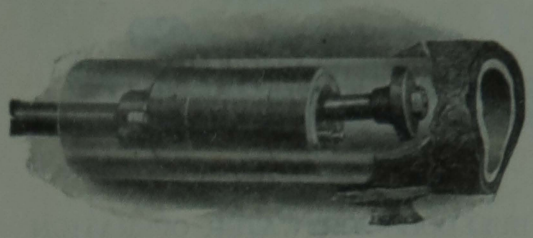


Fig. 3749

Operating in a Return Tubular Boiler

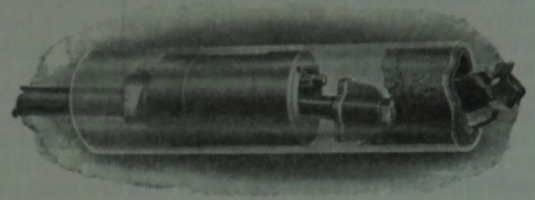


Fig. 3750

Operating in a Water Tube Boiler

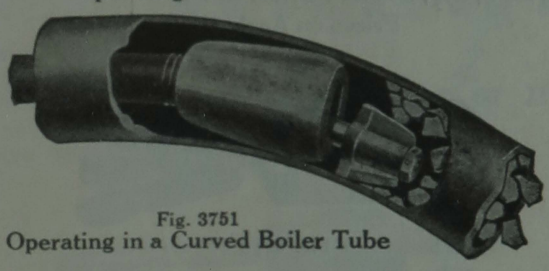


Fig. 3751

Operating in a Curved Boiler Tube

May be used to clean return tubular boilers, water tube boilers, Stirling or curved tube boilers of any type, locomotive boilers and condenser, superheater, evaporator, locomotive arch or any other form of tube. Can be used interchangeably in fire tube and water tube boilers and with a simple attachment the same cleaner may be used in different sizes of tubes.

Operates on the principle of the steam engine; driven either by compressed air or steam, at varying pressures, depending upon the character of the work to be done. Its vibratory action is secured by forcing the vibrator back and forth at speeds ranging from 3,500 to 10,000 times per minute. The resulting rapid movement of the vibrator communicates a series of vibrations to the boiler tube which, being steel and elastic, vibrates in unison. Scale, however, is non-elastic and will not vibrate, hence the scale is forced to give up its tenacious grip upon the tube, quickly disintegrates and breaks up into small pieces.

In water tube boilers scale is blown out by the exhaust; in fire tube boilers it falls to the bottom of the boiler. The No. 10 is for curved boiler tubes. The No. 11 is for locomotive arch tubes.

NOS.	For Tubes, Ins.	Weight Each, Lbs.	Each
5	3	11	$90.00
6	3½	15	90.00
7	4	17	90.00
8	4½	19	95.00
8–0	5	21	95.00
8–0	5½	23	95.00
9	6	25	100.00
10	Curved Tubes	9	100.00
11	Locomotive Arch Tubes	9	100.00
3	2	6	100.00
4	2½	10	100.00
Swivel Couplings	.....	.....	10.00

One in a Wood Box

BOILER TUBE CLEANERS

LIBERTY

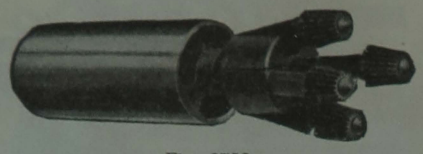


Fig. 3752

BULLDOG—FOR WATER OPERATION

Consists of water turbine driving type "A" swinging arm head for light scale and type "LL" universal joint and "B" drill for heavy scale. Body of cleaner, made of machinery steel, is provided with a removable bearing supported by the spider arm which is made of hardened steel and forced to its seat by hydraulic pressure. Has turbine wheel of bronze mounted on rear end of hardened steel shaft, which extends forward through one bearing. The single bearing is considered superior to double bearings, as it results in even distribution of wear. All parts are removable and renewable. No rivets are used in the construction of the swinging arm head. It may be taken apart and assembled by hand without the use of tools. Made for 3, 3¼, 3½ and 4-inch tubes.

Prices on Application

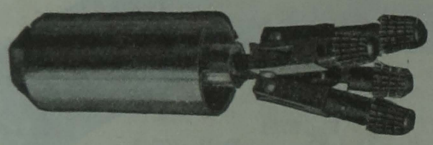


Fig. 3753

STANDARD—FOR WATER OPERATION

Has type "C" swinging arm head for light scale and type "LL" universal joint and drill for heavy scale. Body of cleaner machined from bronze casting. Bearing is of hardened steel; turbine wheel of special bronze. Of solid construction throughout. All parts are renewable.

Made for 3, 3¼, 3½ and 4-inch tubes.

Prices on Application

Fig. 3754

"BA" STANDARD—FOR WATER OPERATION

Has swinging two-arm head for light scale and "LL" universal joint and drill for heavy scale. Turbine is inclosed in steel casing. Turbine wheel of high grade phosphor bronze; shaft of best grade steel, runs in a long, removable bushing.

Made for small tubes from 1¾ to 3 inches.

Prices on Application

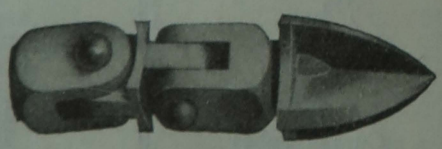


Fig. 3755

NO. "LL."—UNIVERSAL JOINT AND DRILL

Furnished with all cleaners in addition to type of heads shown in above illustrations.

BOILER TUBE CLEANERS

LIBERTY

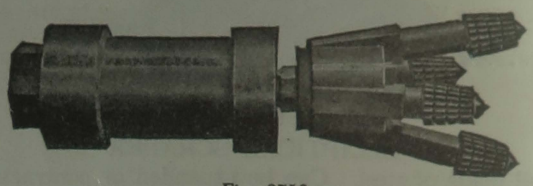


Fig. 3756

VICTOR, AIR OR STEAM OPERATED

Furnished with type "A," "E" or "F" swinging arm heads. Head "A" is satisfactory for ordinary use on light scale, but for very thin and hard scale type, "E" or "F" should be used. Also furnished with 3 solid drills. The body and cutters are of the best materials and construction throughout. The motor has removable outer shell. By unscrewing rear hose coupling the interior of motor can be removed for inspection and adjustment.

Made for 2 to 4-inch tubes.

Prices on Application

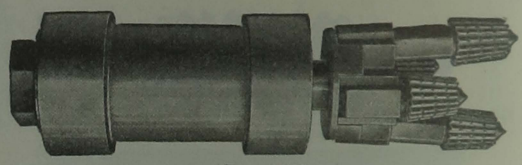


Fig. 3757

CYCLONE, AIR OR STEAM OPERATED

Furnished with swinging arm head for light scale and universal joint and drill for heavy scale. Motor consists of outer casing containing removable hardened steel cylinder in which revolves an eccentrically mounted shaft having a longitudinal slot in which a pair of semi-balanced blades reciprocate. Wear on blades is taken up automatically, which insures a tight joint between blades and cylinder wall.

Made for straight or bent tubes from 2 to 4 inches, inclusive.

Prices on Application

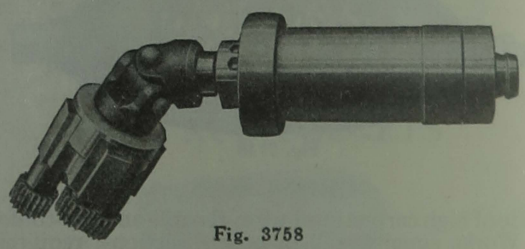


Fig. 3758

CYCLONE, AIR OR STEAM OPERATED

Made for bent tubes, 3¼ inches and smaller; cleaner for bent tubes from 3½ to 4 inches is made with tapered body.

Prices on Application

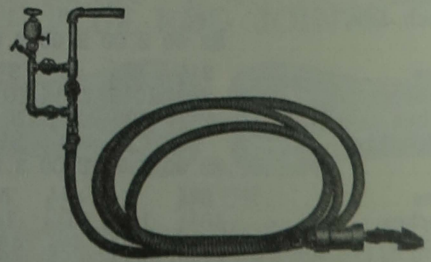


Fig. 3759

Shows method of connecting up pneumatic cleaner with lubricator.

STEAM FLUE CLEANERS

HURRICANE

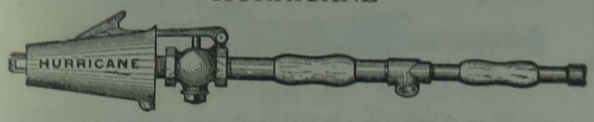


Fig. 3760

Valve opens when entering tube and closes when withdrawn. Soot and ashes do not blow back on operator.

Very light and easy to handle. Uses steam only when in operation. Operates in horizontal position. Two and 2½ inch sizes have hand valves, other sizes are equipped with automatic shut-off valve. Iron pipe thread connections.

Size, Inches	2–2½	3–3½	4–4½
For Steam Hose, Inches	½	½	¾
Weight Each, Lbs.	...	...	...
Each	$8.00	9.00	10.00

Price does not include hose, couplings and clamps. State steam pressure when ordering.

BOILER TUBE SOOT BLOWERS

CLAFLIN

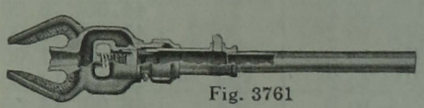


Fig. 3761

Automatic Push Type Head

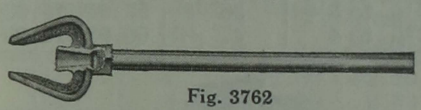


Fig. 3762

Continuous Blast Head

Fig. 3763

With Steam and Air Connections

Automatic push type blowers for pressures up to 120 pounds have a telescoping self-closing valve combined with the head, by which the steam is automatically shut off when blower is moved from tube to tube. Continuous blast type blowers have no self-closing valve and the discharge of steam is continuous. Both types have a single, high velocity direct expansion steam nozzle centered between two tapering prongs of a self-centering skeleton head. The head occupies the smallest tube area at each blow and permits a great volume of air to be drawn into the tube by the swiftly moving steam jet. The proportions of steam and air used at ordinary steam pressures are about 2½ parts of air to 1 of steam by weight. Steam and air as used by this type of blower exert a greater cleaning force than when steam only is used.

NOS. Auto-Push 101R / NOS. Cont-Blast 201R	102R / 202R	112R / 212R	103R / 203R	113R / 213R
Blows Tubes O. D., Inches	2–2¾	3–4	3–4	4–5	4–5
Steam Hose Required I. D., Inches	¾	1	¾	1¼	1
Min. Operating Pres., Lbs.	30–40	30–50	50–90	40–60	50–80
Auto-Push Type, Each	$19.50	21.00	21.00	24.00	24.00
Cont.-Blast Type, Each	$13.50	15.00	15.00	16.50	16.50
Extra Union Conn., Each	$0.48	.56	.48	.76	.56

Blowers are furnished with one coupling for steam supply pipe and couplings for two ends of hose but no hose.

TUBE EXPANDERS

DUDGEON

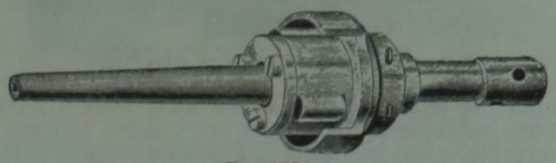


Fig. 3764

Roller Type

Tubes can be expanded without striking a blow. Leaky tubes can be tightened with perfect safety, with steam on the boiler, and expander will answer for any thickness of tube sheet.

Diameter, Inches	1	1¼	1½	1¾
Weight Each, Lbs.	1½	2	3¼	4
Each	$10.00	12.00	13.00	15.00
Diameter, Inches	**1⅞**	**2**	**2¼**	**2½**
Weight Each, Lbs.	4¾	5	6½	8
Each	$17.00	20.00	25.00	29.00
Diameter, Inches	**2¾**	**3**	**3¼**	**3½**	**3¾**
Weight Each, Lbs.	10½	12½	16	17	19
Each	$34.00	39.00	44.00	48.00	58.00
Diameter, Inches	**4**	**4½**	**5**	**6**	**7**
Weight Each, Lbs.	22	29	35	40	44
Each	$58.00	60.00	75.00	90.00	110.00

The size refers to external diameter of tube.

Give outside diameter of tubes when ordering.

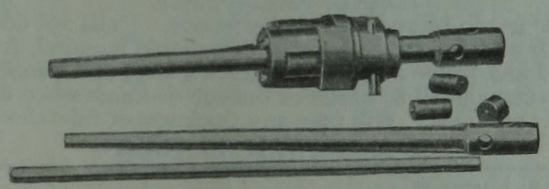


Fig. 3765

Compound Roller Type

By the use of the roller type of expander tubes may be tightened with safety even when there is steam on the boiler. The danger of splitting the tubes is also eliminated as the expansion is accomplished without striking a blow.

Will expand two sizes up to 2-inch, and three sizes above 2 inch.

For Tubes, Inches	1⅝-1¾	1¾-1⅞	1⅞-2
Weight Each, Lbs.	4½	5	6
Each	$20.00	22.00	25.00
For Tubes, Inches	**2-2¼**	**2¼-2½**	**2½-2¾**
Weight Each, Lbs.	6½	8½	11
Each	$30.00	35.00	40.00
For Tubes, Inches	**2¾-3**	**3-3¼**	**3¼-3½**
Weight Each, Lbs.	14	17	20
Each	$45.00	52.00	60.00
For Tubes, Inches	**3½-3¾**	**3¾-4**	**4-4½**
Weight Each, Lbs.	21	23½	27¼
Each	$65.00	70.00	75.00
For Tubes, Inches	**4¼-4½**	**4½-4¾**	**4¾-5**
Weight Each, Lbs.	21	31	45
Each	$80.00	85.00	90.00
For Tubes, Inches	**5-5½**	**5½-6**	**6-6½**
Weight Each, Lbs.	53½	60	45
Each	$100.00	110.00	120.00

The size refers to external diameter of tube. Larger sizes will be furnished to order.

Give outside diameter of tube when ordering.

TUBE EXPANDERS

Fig. 3766

VICTOR—SELF-FEED

Constructed of selected steel, carefully tempered. Expander is self-feeding. Can be used with any power machine having a square socket or by hand without any change. Rolls will not drop to inside or outside of frame when mandrel is removed. All expanders have right-hand feed and are furnished with standard combination square mandrels.

NO. 38—POWER OR HAND

Size of Expander for Tube I.D. Inches	Will Enter and Expand Tubes O.D. from Inches	Shipping Weight, Lbs.	Each	Extra Mandrels Each	Extra Rolls Each
1 5/8	1 3/8 to 1 5/8	6 1/2	$16.00	$3.50	$0.30
1 3/4	1 1/2 to 1 3/4	7	16.00	3.50	.30
1 7/8	1 39/64 to 1 7/8	7 1/2	16.00	3.50	.30
2	1 23/32 to 2	8	16.00	3.50	.30
2 1/8	1 13/16 to 2 1/8	8 1/2	18.00	3.50	.30
2 1/4	1 15/16 to 2 1/4	9	18.00	3.50	.30
2 3/8	2 1/16 to 2 3/8	10 1/2	19.50	4.50	.30
2 1/2	2 5/32 to 2 1/2	11	19.50	4.50	.30

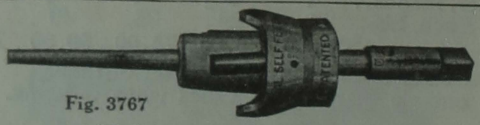


Fig. 3767

IDEAL—SELF-FEED

For use in railroad and boiler shops. Rolls are double length and reversible. Rolls, detachable mandrel, frame guard and frame are made of refined steel and tempered. Rolls cannot fall to inside or outside of frame when mandrel is removed. Will take any thickness of tube sheet.

NO. 40—POWER OR HAND

Size of Expander for Tube O.D. Inches	Will Enter and Expand Tubes I.D. from Inches	Shipping Weight, Lbs.	Each	Extra Mandrels Each	Extra Rolls Each
1	27/32 to 1	3 1/2	$16.00	$3.50	$0.30
1 1/8	15/16 to 1 1/8	4	16.00	3.50	.30
1 1/4	1 1/16 to 1 1/4	4	16.00	3.50	.30
1 3/8	1 5/32 to 1 3/8	4 1/2	16.00	3.50	.30
1 1/2	1 9/32 to 1 1/2	4 1/2	16.00	3.50	.30
1 5/8	1 3/8 to 1 5/8	6 1/2	16.00	3.50	.30
1 3/4	1 1/2 to 1 3/4	7	16.00	3.50	.30
1 7/8	1 39/64 to 1 7/8	7 1/2	16.00	3.50	.30
2	1 23/32 to 2	8	16.00	3.50	.30
2 1/8	1 13/16 to 2 1/8	8 1/2	18.00	3.50	.30
2 1/4	1 15/16 to 2 1/4	9	18.00	3.50	.30
2 3/8	2 1/16 to 2 3/8	10 1/2	19.50	4.50	.30
2 1/2	2 5/32 to 2 1/2	11	19.50	4.50	.30
2 5/8	2 9/32 to 2 5/8	13 1/2	22.00	4.50	.60
2 3/4	2 13/32 to 2 3/4	14 1/2	22.00	4.50	.60
3	2 5/8 to 3	17	22.00	5.50	.60
3 1/4	2 7/8 to 3 1/4	18 1/2	24.50	5.50	.70
3 1/2	3 1/8 to 3 1/2	21	24.50	6.50	.70
3 3/4	3 3/8 to 3 3/4	23	27.00	6.50	.80
4	3 9/16 to 4	28	27.00	7.50	.80
4 1/4	3 13/16 to 4 1/4	31	40.00	10.00	1.10
4 1/2	4 1/16 to 4 1/2	32	50.00	10.00	10.10
4 3/4	4 1/4 to 4 3/4	35	55.00	15.00	2.00
5	4 1/2 to 5	39 1/2	55.00	15.00	2.00
5 1/4	4 11/16 to 5 1/4	40 1/2	60.00	18.00	2.50
5 1/2	4 15/16 to 5 1/2	51	60.00	18.00	2.50
6	5 3/8 to 6	55	65.00	20.00	3.00

List prices show smallest inside diameter any expander passes into and what it will expand to, enabling one to select an expander with proper range regardless if used on straight tubes, swedged tubes or pipe.

TUBE EXPANDERS

FOR WATER TUBE BOILERS

Fig. 3768

SELF-FEED—POWER OR HAND

Made principally for Heine safety water tube boilers and other similar types; adjustable for all size water legs. Made of best tool steel, tempered, for power and also for hand use; self-feeding. Will take any thickness of tube sheet. Furnished with frictionless phosphor-bronze bearing. Have right-hand feed and are supplied with standard deteachable combination square shank mandrels Rolls cannot fall outside of frame.

NO. 91

Size of Expander for Tube O.D. Inches	Will Enter and Expand Tubes I.D. from Inches	Shipping Weight, Lbs.	Each	Extra Mandrels Each	Extra Rolls Each
2	1 23/32 to 2	15 1/2	$40.00	$8.00	$0.30
2 1/4	1 15/16 to 2 1/4	17	44.00	8.00	.30
2 3/8	2 1/16 to 2 3/8	20 1/2	45.00	11.00	.30
2 1/2	2 5/32 to 2 1/2	21	46.00	11.00	.30
2 3/4	2 13/32 to 2 3/4	23	48.00	14.00	.60
3	2 5/8 to 3	24	48.00	14.00	.60
3 1/4	2 7/8 to 3 1/4	34	55.00	14.00	.70
3 1/2	3 1/8 to 3 1/2	38	57.00	15.00	.70
4	3 9/16 to 4	47	60.00	16.00	.80

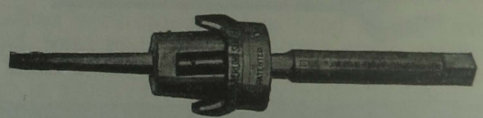


Fig. 3769

SELF-FEED—POWER OR HAND

Made especially for the Sterling water tube boiler and other similar types. Will take any thickness of tube sheet. Self-feeding; for power and also for hand use. The rolls, detachable mandrel, frame and guard are made of best tool steel, finely tempered. Rolls cannot fall inside or outside of frame when mandrel is removed. Have frictionless phosphor-bronze bearing and right hand feed. Furnished with standard detachable combination square shank mandrels.

	Each
NO. 120—For Tube O. D., 3 1/4 Inches; Will enter and expand tubes I.D., from 2 7/8 to 3 1/4 Inches; Shipping Weight, 23 Lbs.	$32.00
Extra Mandrels, Each	12.00
Extra Rolls, Each	1.00

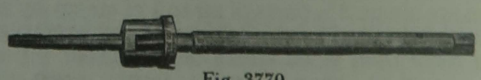


Fig. 3770

SELF-FEED—POWER OR HAND

Made for Heine safety water tube boilers and similar types of specially selected steel for power use with machine having a square socket or can be used by hand without change. Rolls cannot fall to inside or outside of frame when mandrel is removed. Have right hand feed and are furnished with standard combination square shank mandrels.

NO. 130

For Tube O.D., Inches	3 1/2	4
Will Enter and Expand Tubes I.D., from Inches	3 1/16 to 3 1/2	3 9/16 to 4
Shipping Weight, Lbs.	25	32
Each	$32.00	35.00
Extra Mandrels, Each	15.00	16.00
Extra Rolls, Each	1.20	1.50

TUBE EXPANDERS

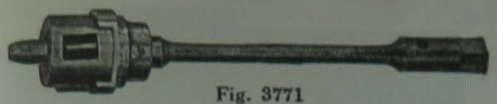


Fig. 3771

SELF-FEED-POWER FOR WATER TUBE BOILERS

Specially designed for Babcock & Wilcox water tube boilers and similar types.

NO. 140—For Tube O.D., 4 Inches; will enter and Expand Tube I.D. from 3 7/16 to 4 Inches; Shipping Weight, 24 Lbs. ..... Each $55.00
Extra Mandrels, Each 13.00
Extra Rolls, Each 1.00

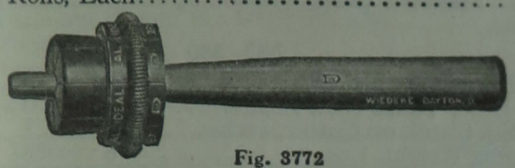


Fig. 3772

SECTIONAL SPRING—HAND POWER

For setting and tightening copper ferrules; made of highest grade tool steel carefully tempered. Machined and cut, with all sections interchangeable. Can be used on any thickness tube sheet to 3/4 inches. Will set and tighten all ferrules 1/64-inch from front of sheet preventing copper from getting under the head.

NO. 226

For Ferrules O.D., Inches	Will Enter and Expand I.D., Inches	Shipping Weight, Lbs.	Each	Extra Round Pins, Each	Extra Springs, Each
1 1/2	1 1/4	4	$12.00	$2.50	$0.40
1 5/8	1 3/8	4	12.00	2.50	.40
1 3/4	1 1/2	4 1/2	12.00	2.50	.40
1 7/8	1 5/8	4 1/2	12.00	2.50	.40
2	1 3/4	5	12.00	2.50	.40
2 1/8	1 7/8	5	13.00	2.50	.40
2 1/4	2	5 1/2	13.00	2.50	.40
2 3/8	2 1/8	7	15.00	3.00	.40
2 1/2	2 1/4	7	15.00	3.00	.40

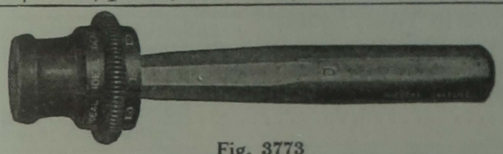


Fig. 3773

SECTIONAL SPRING—POWER OR HAND

Constructed of steel and carefully tempered. All sections are interchangeable. Expanders assume a true circle after being expanded in full. Made with double taper to relieve rear of sections and releasing pin, bringing actual working surface together only. Can be furnished in 1/2, 9/16 and 5/8-inch plate. Mention what plate is wanted when ordering.

NO. 285

For O.D. Tubes, Inches	Will Enter and Expand Tubes I.D., Inches	Shipping Weight, Lbs.	Each	Extra Oct. Pins, Each	Extra Springs, Each
1 1/2	1 9/32	4	$12.00	$3.00	$0.40
1 5/8	1 3/8	4	12.00	3.00	.40
1 3/4	1 1/2	4 1/2	12.00	3.00	.40
1 7/8	1 39/64	4 1/2	12.00	3.00	.40
2	1 23/32	5	12.00	3.00	.40
2 1/8	1 13/16	5	13.00	3.00	.40
2 1/4	1 15/16	5 1/2	13.00	3.00	.40
2 3/8	2 1/16	7	15.00	4.00	.40
2 1/2	2 5/32	7	15.00	4.00	.40
3	2 5/8	9 1/2	22.00	6.00	.75
3 1/2	3 1/8	14	30.00	8.00	1.00
4	3 9/16	16 1/2	33.00	8.00	1.00

TUBE EXPANDERS

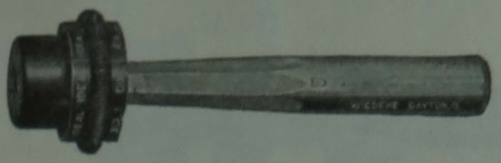


Fig. 3774

SECTIONAL SPRING—POWER OR HAND

For railroad shop use. Used for repair, reworking or hot work. Constructed of highest grade steel. Expanders are machined and cut and have all sections interchangeable. Assume a true circle when expanded in full in the tube. Made with a double taper to relieve rear of sections bringing actual working face together only. Coil steel spring with self-releasing octagon pin will permit uniform distribution of all sections in one turn. Can be furnished with extra round pins, or self-releasing octagon pin; coil steel springs or rubber bands. Orders will be filled with expanders having coil steel springs and self-releasing octagon pins unless otherwise specified. Adaptable to any thickness tube sheet up to and including 3/4 inch.

NO. 230

For O.D. Tubes, Inches	Will Enter and Expand Tubes I.D., Inches	Shipping Weight, Lbs.	Each	Extra Oct. Pins, Each	Extra Springs, Each
1 5/8	1 3/8	4	$12.00	$3.00	$0.40
1 3/4	1 1/2	4 1/2	12.00	3.00	.40
1 7/8	1 39/64	4 1/2	12.00	3.00	.40
2	1 23/32	5	12.00	3.00	.40
2 1/8	1 13/16	5	13.00	3.00	.40
2 1/4	1 15/16	5 1/2	13.00	3.00	.40

BEADING TOOLS

Fig. 3775

FOR HAND USE

Made of very tough high grade tool steel tempered with great care. Makes proper bead as adopted by most American railroad systems and boiler makers always state for what size and style tubes wanted.

Each

NO. 148—Weight Each, 1 Lb. $1.50

Fig. 3776

FOR POWER

Made of the highest grade 7/8-inch octagon hammered tool steel and tempered with great care. Makes proper bead as adopted by most American railroad systems and boiler makers.

Each

NO. 149—Size of shank, 1 1/16 Inch Dia. by 2 3/8 Inches Long, Weight Each, 1 1/2 Lbs. $2.50

When ordering, state whether wanted for the small, standard locomotive boiler tubes such as 2 and 2 1/4-inch, or for arch tubes or super-heater tubes.

TUBE CUTTERS

IDEAL

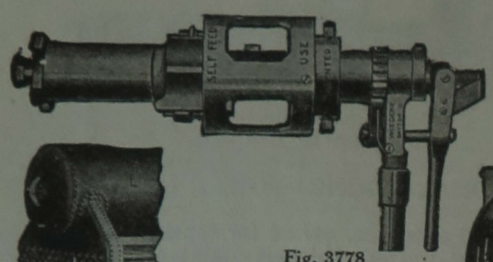


Fig. 3778

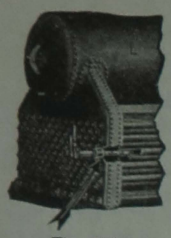


Fig. 3777

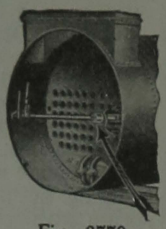


Fig. 3779

Constructed entirely of specially selected material. Principal wearing parts made of drop forged steel and tempered. By moving guard back, which requires but a minute, old tubes can be cut out inside of boiler head or with extension connected in a water tube boiler as shown in illustration. Will cut off new steel tubes without cracking or splitting, leaving tubes with a bevel ready for heading. Operates to the right. It becomes self-feeding by hooking the feed handle on the stud parallel with the ratchet handle. One man operates cutter with one hand. Feeds automatically while ratchet handle is turned from left to right. Will bevel tubes outward when cutting. Tubes are cut with a scarfing edge ready for welding. Distance of cut from boiler head can be set to suit boiler maker. When cutting out old tubes it is only necessary to move the guard back and tubes may be cut off inside boiler head, leaving a scarfing edge ready for welding. To take cutter apart, simply remove split cutter and block; this will allow wedge to come forward and the cutter carrier to drop out.

NO. 375

For Tube O.D. Inches	2	2¼	2½	2¾
Will Enter Tubes I.D., Inches	1 23/32	1 31/32	2 7/32	2 7/16
Shipping Weight, Lbs.	18	19	20	20
Each	$40.00	44.00	46.00	50.00

For Tube O.D., Inches	3	3¼	3½	4
Will Enter Tubes I.D., Inches	2 11/16	2 27/32	3 1/8	3 5/8
Shipping Weight, Lbs.	29	30	32	33
Each	$60.00	66.00	68.00	70.00

For Tube O.D., Inches	4½	5	5½	6
Will Enter Tubes I.D., Inches	4 1/16	4½	4 15/16	5 3/8
Shipping Weight, Lbs.	51	54	55	56
Each	$110.00	126.00	128.00	130.00

CUTTER WHEELS

Size, Inches	2	2¼	2½	2¾
Each	$1.00	1.00	1.00	1.00
Per Dozen	$6.00	6.00	6.00	6.00

Size, Inches	3	3¼	3½	4
Each	$1.00	1.00	1.00	1.00
Per Dozen	$6.00	6.00	6.00	6.00

Size, Inches	4½	5	5½	6
Each	$2.00	2.60	2.60	2.60
Per Dozen	$12.00	15.00	15.00	15.00

Note.—When ordering tube cutters or extra parts, mention the figure number and for what size tube cutter is wanted.

TUBE CUTTERS

Fig. 3780

FOR POWER AND HAND USE

Designed for power use in Railroad and Boiler Shops; can also be used by hand. Constructed entirely of tool steel. Makes a clean, smooth square cut in 1⅓ revolutions.

NO. 360

For Tube O.D., Inches	1¾	2	2¼
Will Enter Tubes I.D., Inches	1 7/16	1 11/16	1 15/16
Size Sq. Shank on Cutter, Inches	1	1	1
Shipping Weight, Lbs.	6	6½	7½
Each	$55.00	55.00	55.00
Knife, High Speed, Each	$ 1.00	1.00	1.00
Knife, High Speed, per Doz	$9.00	9.00	9.00

YOKES

FOR TUBE CUTTERS

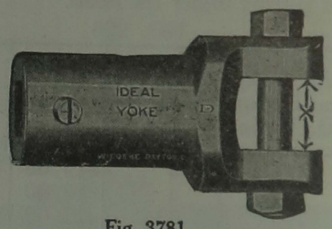


Fig. 3781

For connecting tube cutters listed above to any kind of power appliance. Made of a special durable steel.

NO. 365

NOS	2
Fits Tube Cutters, Inches	1¾–2–2¼
Size Hole in Yoke, Inches	1
Size Bolt, Inches	⅝
Distance Between Arms, Inches	1 9/32
Shipping Weight, Lbs.	6
Each	$14.00

EXTENSIONS

FOR TUBE CUTTERS

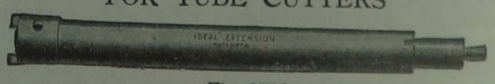


Fig. 3782

The proper length extension connected to tube cutter No. 375 will enable a boiler maker to stand upright outside of a smoke box of a thresher or traction engine, locomotive or portable boiler, vertical or submerged J. B. W. Heine or any other similar types of boilers while cutting out tubes.

NO. 377

NOS	*D1½	*D3	*D6	*D8	†E1
Length, Inches	19	38	72	96	19
Shipping Weight, Lbs.	9	25	37	49	12
Each	$10.00	20.00	40.00	45.00	12.00

NOS	†E3	†E6	†E8	**F1½	**F3
Length, Inches	38	72	96	19	38
Shipping Weight, Lbs.	31	41	55	25	35
Each	$25.00	45.00	50.00	45.00	55.00

*Type D fits 2, 2¼, 2½ and 2¾-inch tube cutters.
†Type E fits 3, 3¼, 3½ and 4-inch tube cutters.
**Type F fits 4½, 5, 5½ and 6-inch tube cutters.
Mention number and size when ordering.

SPIRAL RIVETED PIPE

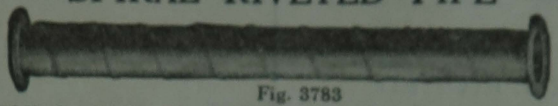


Fig. 3783

WITH PLAIN ENDS—22 B. W. G. NO. 20 B. W. G. NO. 18 B. W. G.

Size, Inches	3	3	4	5	3	4	5	6	7	8
Approximate Weight per 100 Feet, Lbs.	115	147	195	242	205	273	340	386	446	507
Per Foot, Black	$0.24	.27	.35	.40	.34	.42	.50	.57	.63	.73
Per Foot, Asphalted	.....	$0.30	.39	.45	.37	.46	.55	.64	.71	.82
Per Foot, Galvanized	.42	$0.45	.59	.70	.53	.67	.82	.93	1.05	1.21

NO. 16 B. W. G.

Size, Inches	4	5	6	7	8	9	10	12	14
Approximate Weight per 100 Feet, Lbs.	360	448	508	588	669	753	835	1003	1199
Per Foot, Black	$0.50	.60	.70	.80	.93	1.08	1.15	1.45	1.70
Per Foot, Asphalted	$0.55	.66	.77	.88	1.02	1.18	1.26	1.58	1.85
Per Foot, Galvanized	$0.77	.94	1.08	1.24	1.44	1.65	1.78	2.19	2.53

NO. 14 B. W. G.

Size, Inches	6	7	8	9	10	12	14	15	16	18	20
Approximate Weight per 100 Feet, Lbs.	653	755	860	967	1071	1287	1539	1649	1771	1974	2180
Per Foot, Black	$0.89	1.02	1.15	1.32	1.40	1.80	2.10	2.25	2.40	2.75	3.10
Per Foot, Asphalted	$0.96	1.10	1.24	1.42	1.52	1.94	2.26	2.42	2.58	2.95	3.33
Per Foot, Galvanized	$1.30	1.50	1.69	1.93	2.07	2.59	3.00	3.23	3.49	3.96	4.44

NO. 12 B. W. G.

Size, Inches	6	7	8	9	10	12	14	15	16	18	20
Approximate Weight per 100 Feet, Lbs.	858	992	1130	1271	1408	1692	2022	2167	2327	2593	2863
Per Foot, Black	$1.10	1.34	1.51	1.70	1.84	2.36	2.75	3.00	3.15	3.60	4.00
Per Foot, Asphalted	$1.17	1.42	1.61	1.81	1.96	2.50	2.92	3.18	3.34	3.81	4.24
Per Foot, Galvanized	$1.55	1.86	2.10	2.36	2.58	3.22	3.72	4.07	4.34	4.92	5.46

NO. 10 B. W. G.

Size, Inches	12	14	15	16	18	20	22	24	26	28	30
Approximate Weight per 100 Feet, Lbs.	2080	2486	2664	2861	3188	3521	3860	4216	4380	4720	5063
Per Foot, Black	$2.82	3.30	3.60	3.80	4.30	4.90	5.25	5.70	6.16	6.60	7.10
Per Foot, Asphalted	$2.97	3.47	3.79	4.00	4.52	5.15	5.51	5.98	6.46	6.94	7.46
Per Foot, Galvanized	$3.75	4.37	4.79	5.02	5.73	6.48	6.93	7.51	8.21	8.74	9.49

Note.—4 and 5-inch pipe is not made in No. 22 gauge.

State working pressure and the purpose for which pipe is to be used and also kind of material to be conveyed.

Prices on plain black and asphalted are figured per 100 lineal feet in four standard 25-foot lengths. Weights on above are those for black pipe. Prices and weights on galvanized are figured in five standard 20-foot lengths. Shorter lengths are subject to an increased price.

WITH FLANGED ENDS

Inside Diameter, Inches	3	4	5	6	7	8	9	10	11
Thickness, B. W. G., Nos.	20	20	20	18	18	18	16	16	16
Approximate Weight per Foot, Lbs.	2	3	3½	5	6	6½	9	10½	11½
Per Foot, Galvanized	$0.55	.72	.85	1.13	1.30	1.49	2.01	2.17	2.30
Per Foot, Asphalted	$0.38	.49	.56	.78	.89	1.02	1.43	1.54	1.63

Inside Diameter, Inches	12	13	14	15	16	18	20	22	24
Thickness, B. W. G., Nos.	16	16	14	14	14	14	14	12	12
Approximate Weight per Foot, Lbs.	12½	14	18½	20	22	25	27½	39½	43
Per Foot, Galvanized	$2.65	2.96	3.66	4.00	4.42	5.06	5.65	7.60	8.20
Per Foot, Asphalted	$1.91	2.04	2.65	2.89	3.14	3.62	4.08	5.65	6.17

Weights on pipe with flanged ends are for asphalted pipe.

Specify maximum working pressure under which piping is to be used.

Galvanized pipe is furnished in 20-foot lengths and asphalted pipe in 25-foot lengths. Prices include flanges attached

SPIRAL RIVETED PIPE CONNECTIONS

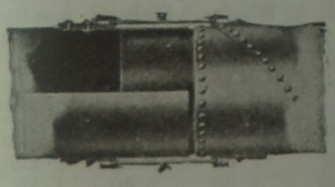


Fig. 3784

Slip Joints

Size, Inches	Flanges Riveted to Pipe		Bolted Joints Complete	Size, Inches	Flanges Riveted to Pipe		Bolted Joints Complete
	Each Black	Each Galv.	Each Black		Each Black	Each Galv.	Each Black
3	$0.78	$0.87	$1.22	12	$3.52	$4.50	$6.70
4	.94	1.06	1.70	14	4.15	5.85	8.70
5	1.10	1.25	2.00	15	5.97	6.94	10.45
6	1.52	1.71	2.90	16	6.02	8.46	12.55
7	1.95	2.20	3.20	18	6.92	9.57	13.35
8	2.21	2.50	3.40	20	7.74	10.60	13.45
9	2.78	3.15	3.90	22	11.34	15.40	15.00
10	3.05	3.50	6.00	24	12.26	16.70	17.00

Price is for one flange only. Bolts and gaskets are not included.

Slip joints are largely used for medium and low pressure work. The sleeve, attached to one end of pipe, is wrapped with burlap soaked in red lead or tar, then driven into the adjoining pipe. Lugs are connected by wire in order to hold pipe securely. **Price on Application.**

CAST IRON FLANGED FITTINGS

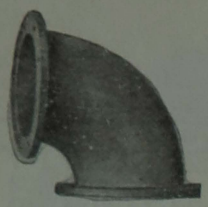


Fig. 3785

FOR SPIRAL RIVETED FLANGED PIPE

ELBOWS

Diameter, Inches	90° Each Black	90° Each Galv.	45° Each Black	45° Each Galv.
3	$1.95	$2.25	$1.95	$2.20
4	2.35	2.80	2.35	2.75
5	3.15	3.75	3.15	3.65
6	4.30	5.05	4.30	4.90
7	5.45	6.45	5.45	6.20
8	7.05	8.50	7.05	8.15
9	9.45	11.30	9.45	10.90
10	10.65	12.85	10.65	12.40
12	15.75	18.70	14.20	16.75
14	22.00	27.65	17.60	20.80
16	31.30	39.40	25.20	29.35
18	40.70	50.15	32.70	39.60
20	51.60	65.30	41.60	50.00
22	68.80	87.10	55.50	67.40
24	84.50	108.30	68.00	83.25

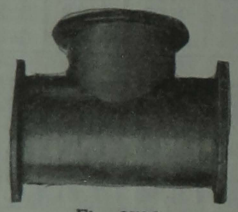


Fig. 3786

TEES

Diameter, Inches	Straight Each Black	Straight Each Galv.	Reducing Each Black	Reducing Each Galv.
3	$2.75	$3.21	$4.00	$....
4	3.45	4.10	4.55	5.45
5	4.85	5.37	5.35	6.55
6	6.10	7.20	6.85	8.35
7	7.80	9.25	9.15	11.00
8	10.30	12.20	10.70	12.85
9	13.70	16.40	13.70	16.60
10	16.40	19.80	15.25	18.75
12	22.70	27.20	20.60	25.20
14	31.30	38.80	25.90	31.70
16	47.00	58.35	30.50	38.10
18	70.40	84.15	36.60	46.20
20	90.70	111.30	42.70	54.00
22	98.50	126.00	168.00	222.00
24	142.90	178.60	206.00	272.00

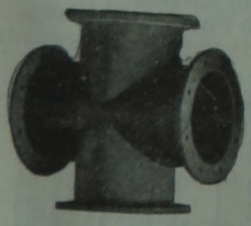


Fig. 3787

CROSSES

Dia., Ins.	Each Black	Each Galv.
3	$4.70	$5.46
4	5.80	6.81
5	7.50	8.60
6	8.00	10.30
7	12.10	13.95
8	15.30	18.05
9	18.80	22.50
10	22.70	26.85
12	32.80	39.40
14	46.10	58.35
16	68.80	85.80
18	79.80	100.50
20	106.35	133.70
22	131.40	168.00
24	154.80	202.40

Above fittings drilled in accordance with spiral pipe standard; drilled with A. S. M. E. standard at extra cost.

CAST IRON FLANGED FITTINGS

FOR SPIRAL RIVETED FLANGED PIPE

Y BRANCHES

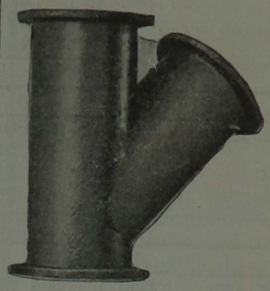


Fig. 3788

Dia., Ins.	Y Branch Each Black	Y Branch Each Galv.
3	$....	$....
4	8.00	9.90
5	10.30	12.60
6	12.50	16.50
7	14.00	18.70
8	20.00	27.00
9	29.00	37.50
10	35.00	50.00
12	54.00	71.00
14	74.00	100.00
16	125.00	168.00
18	142.00	191.00
20	154.00	208.00
22	197.00	266.00
24	249.00	336.00

FLANGES

Diameter, Inches	Outside Diameter, Inches	Thickness of Flange, Inches	Flanges Loose Each Black	Flanges Loose Each Galv.
3	6	5/16	$0.54	$0.45
4	7	5/16	.73	.64
5	8	5/16	.91	.76
6	9	3/8	1.10	.91
7	10	3/8	1.28	1.03
8	11	3/8	1.45	1.17
9	13	3/8	1.92	1.55
10	14	3/8	2.23	1.80
12	16	7/16	2.56	2.07
14	18	7/16	3.20	2.59
16	21 1/4	5/8	5.18	4.14
18	23 1/4	5/8	5.94	4.75
20	25 1/4	5/8	6.54	5.24
22	28 1/4	11/16	10.67	8.53
24	30	11/16	11.43	9.14

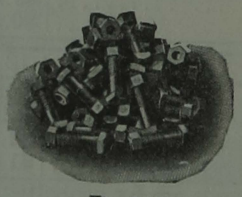


Fig. 3789

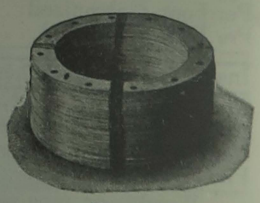


Fig. 3790

BOLTS AND GASKETS

Size, Ins.	Spiral Pipe Standard Bolts, Black	Bolts, per Set Galv.	Gaskets, Each	A. S. M. E. Standard Bolts, Black	Bolts, per Set Galv.	Gaskets, Each
3	$0.17	$0.23	$0.17	$0.30	$0.50	$0.35
4	.35	.45	.20	.50	.80	.40
5	.35	.45	.25	.95	1.55	.45
6	.45	.60	.30	1.00	1.65	.65
7	.45	.60	.35	1.00	1.65	.70
8	.45	.60	.45	1.00	1.65	.90
9	.45	.60	.60	1.50	2.40	1.15
10	.45	.60	.80	2.30	3.80	1.25
12	.65	.90	1.00	2.30	3.80	1.60
14	.65	.90	1.20	3.25	5.40	2.00
16	.70	.95	1.70	4.35	7.20	2.90
18	1.30	1.95	2.10	6.30	10.50	3.45
20	1.30	1.95	2.40	8.30	13.80	4.00
22	1.30	1.95	3.35	11.30	18.70	4.50
24	1.30	1.95	3.80	11.30	18.70	4.90

WROUGHT IRON AND STEEL PIPE

TRADE CUSTOMS

Quotations subject to change without notice. Sales subject to strikes, accidents or causes beyond control.

Every piece of pipe, tubing, etc., is carefully tested, but as it is impossible to always detect imperfections, the only guarantee given is to replace defective goods. Under no circumstances are we responsible for any damages beyond price of goods. No charges for labor or expense required to repair defective goods or occasioned by them will be allowed. If the goods are defective, the measure of damages is the price of the defective pieces.

Claims for shortage or deductions for erroneous charges must be promptly presented or will not be allowed.

Special goods made to specification, where buyer is to inspect, must be inspected and accepted before shipment is made. After shipment is made, responsibility ceases.

Requests for cancellation of orders calling for odd sizes or cut lengths will not be considered if the manufacture of the material has been commenced when the request reaches the mill.

State whether wrought iron or steel pipe is wanted. Unless otherwise ordered, steel pipe will be shipped.

PIPE CUT TO ORDER—MEASUREMENT OF PIPE

On orders calling for commercial sizes of pipe to be furnished with threads and couplings in sizes ⅛ to 12 inch, inclusive, where orders specify quantity in lineal feet it is understood that random lengths, threaded both ends, with coupling on one end, will be shipped, and the measurement is charged from end to end, that is, over all including coupling.

Orders or inquiries covering cut lengths of any size should specify whether plain ends, threads only, threads and couplings, or flanges are required. A separate charge is made for couplings or flanges, either loose or screwed on pipe, when pipe is ordered cut to specified lengths.

Orders or inquiries covering pipe larger than 12 inch should specify the actual outside diameter of the pipe and the thickness of the wall.

Standard weight pipe is listed and carried in stock threaded and coupled, and will be shipped unless order specifies otherwise. Extra strong, double extra strong, hydraulic, and large O.D. pipe is listed plain ends only and will be so shipped unless order specifies otherwise. An extra charge is made for threads and couplings on these weights.

For pipe smoothed on the inside, known as reamed and drifted, an extra charge is made. Such pipe is furnished in random lengths 20 feet and shorter.

Random lengths of extra strong and double extra strong pipe are considered to be 12 to 22 feet, we to have the privilege of supplying not to exceed 5 per cent of total order in lengths 6 to 12 feet. For cut lengths of any size an extra charge above random lengths will be made.

For galvanized or asphalted pipe an extra charge above black will be made.

Sizes 8, 10 and 12 inch Standard Pipe are listed in several weights and orders or inquiries should specify the weight required.

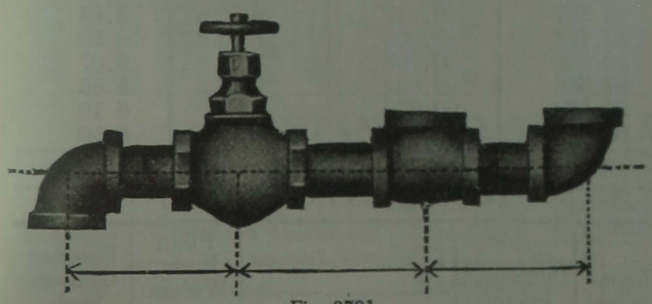


Fig. 3791

Diagram Showing Screwed Valve and Fittings

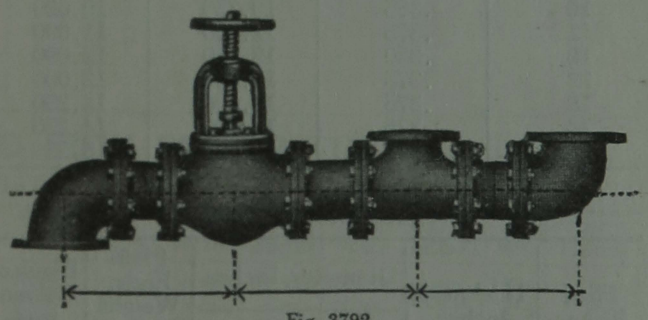


Fig. 3792

Diagram Showing Flanged Valve and Fittings

In laying out work of this kind care should be taken in making sketches. Give measurements from center to center as in above diagrams. State use of pipe and pressure required to withstand.

PRICE FOR CUTTING AND THREADING STANDARD AND EXTRA STRONG PIPE

Size, Inches	⅛	¼	⅜	½	¾	1	1¼	1¼	2	2½	3	3½	4
Cut and Thread, Each	$0.06	.06	.06	.06	.06	.06	.08	.10	.14	.20	.20	.40	.40
Cutting Only, Each	$0.04	.04	.04	.04	.04	.04	.06	.08	.10	.14	.20	.27	.27

Size, Inches	4½	5	6	7	8	9	10	12	14	15	16	18
Cut and Thread, Each	$0.50	.60	.90	1.10	1.20	2.00	2.50	3.50	6.50	7.50	10.00	24.00
Cutting Only, Each	$0.34	.40	.60	.64	.60	1.35	1.67	2.34	4.34	5.00	6.61	16.00

Special price on application for cutting and threading double extra strong pipe.

PRICE LIST OF LOCK-NUT THREADS

Size, Inches	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Each	$0.10	.10	.10	.10	.12	.14	.16	.20	.30	.40	.50	.70

Locknut nipples are made to order and are charged as cut pipe, threads only.

STEAM, GAS AND WATER PIPE

WROUGHT IRON OR STEEL—BLACK AND GALVANIZED

Fig. 3793

STANDARD

List Adopted January 1, 1913

Size, Inches	Thickness, Inches	Diameter, Inches		Weight per Foot, Lbs.		Number of Threads, per Inch	Black or Galvanized, per Foot
		External	Internal	Plain Ends	Threaded and Coupled		
1/8	.068	.405	.269	.244	.245	27	$0.05½
1/4	.088	.540	.364	.424	.425	18	.06
3/8	.091	.675	.493	.567	.568	18	.06
1/2	.109	.840	.622	.850	.852	14	.08½
3/4	.113	1.050	.824	1.130	1.134	14	.11½
1	.133	1.315	1.049	1.678	1.684	11½	.17
1¼	.140	1.660	1.380	2.272	2.281	11½	.23
1½	.145	1.900	1.610	2.717	2.731	11½	.27½
2	.154	2.375	2.067	3.652	3.678	11½	.37
2½	.203	2.875	2.469	5.793	5.819	8	.58½
3	.216	3.500	3.068	7.575	7.616	8	.76½
3½	.226	4.000	3.548	9.109	9.202	8	.92
4	.237	4.500	4.026	10.790	10.889	8	1.09
4½	.247	5.000	4.506	12.538	12.642	8	1.27
5	.258	5.563	5.047	14.617	14.810	8	1.48
6	.280	6.625	6.065	18.974	19.185	8	1.92
7	.301	7.625	7.023	23.544	23.769	8	2.38
8	.277	8.625	8.071	24.696	25.000	8	2.50
8	.322	8.625	7.981	28.554	28.809	8	2.88
9	.342	9.625	8.941	33.907	34.188	8	3.45
10	.279	10.750	10.192	31.201	32.000	8	3.20
10	.307	10.750	10.136	34.240	35.000	8	3.50
10	.365	10.750	10.020	40.483	41.132	8	4.12
11	.375	11.750	11.000	45.557	46.247	8	4.63
12	.330	12.750	12.090	43.773	45.000	8	4.50
12	.375	12.750	12.000	49.562	50.706	8	5.07
13	.375	14.000	13.250	54.568	55.824	8	5.60
14	.375	15.000	14.250	58.573	60.375	8	6.10
15	.375	16.000	15.250	62.579	64.500	8	6.50

EXTRA STRONG

Size, Inches	Thickness, Inches	Diameter, Inches		Plain Ends, Weight per Foot, Lbs.	Black or Galvanized, per Foot
		External	Internal		
1/8	.095	.405	.215	.314	$0.12
1/4	.119	.540	.302	.535	.07½
3/8	.126	.675	.423	.738	.07½
1/2	.147	.840	.546	1.087	.11
3/4	.154	1.050	.742	1.473	.15
1	.179	1.315	.957	2.171	.22
1¼	.191	1.660	1.278	2.996	.30
1½	.200	1.900	1.500	3.631	.36½
2	.218	2.375	1.939	5.022	.50½
2½	.276	2.875	2.323	7.661	.77
3	.300	3.500	2.900	10.252	1.03
3½	.318	4.000	3.364	12.505	1.25
4	.337	4.500	3.826	14.983	1.50
4½	.355	5.000	4.290	17.611	1.80
5	.375	5.563	4.813	20.778	2.08
6	.432	6.625	5.761	28.573	2.86
7	.500	7.625	6.625	38.048	3.81
8	.500	8.625	7.625	43.388	4.34
9	.500	9.625	8.625	48.728	4.90
10	.500	10.750	9.750	54.735	5.48
11	.500	11.750	10.750	60.075	6.10
12	.500	12.750	11.750	65.415	6.55

The permissible variation in weight for standard and extra strong pipe is 5 per cent above and 5 per cent below.

DOUBLE EXTRA STRONG

Size, Inches	Thickness, Inches	Diameter, Inches		Plain Ends, Weight per foot, Lbs.	Black or Galvanized, per Foot
		External	Internal		
½	.294	.840	.252	1.714	$0.32
¾	.308	1.050	.434	2.440	.35
1	.358	1.315	.599	3.659	.37
1¼	.382	1.660	.896	5.214	.52½
1½	.400	1.900	1.100	6.408	.65
2	.436	2.375	1.503	9.029	.91
2½	.552	2.875	1.771	13.695	1.37
3	.600	3.500	2.300	18.583	1.86
3½	.636	4.000	2.728	22.850	2.30
4	.674	4.500	3.152	27.541	2.76
4½	.710	5.000	3.580	32.530	3.26
5	.750	5.563	4.063	38.552	3.86
6	.864	6.625	4.897	53.160	5.32
7	.875	7.625	5.875	63.079	6.35
8	.875	8.625	6.875	72.424	7.25

The permissible variation in weight for double extra strong pipe is 10 per cent above and 10 per cent below.

The outside diameter of goods heavier than standard is the same as standard, the extra thickness being on the inside, so that different weights of the same size use the same couplings.

For length of pipe and extras, see preceding page.

LARGE O. D. PIPE

PLAIN ENDS

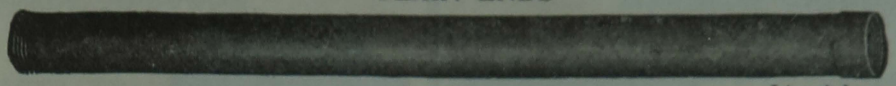


Fig. 3794

List Adopted January 1, 1913.

O. D. Size, Inches	Thickness, Inches											
	1/4		5/16		3/8		7/16		1/2		9/16	
	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot
14	36.713	$3.68	45.682	$4.57	54.568	$5.46	63.371	$6.34	72.091	$7.21	80.726	$8.08
15	39.383	3.94	49.020	4.91	58.573	5.86	68.044	6.81	77.431	7.75	86.734	8.68
16	42.053	4.21	52.357	5.24	62.579	6.26	72.716	7.28	82.771	8.28	92.742	9.28
17	44.723	4.48	55.695	5.57	66.584	6.66	77.389	7.74	88.111	8.82	98.749	9.88
18	47.393	4.74	59.032	5.91	70.589	7.06	82.061	8.21	93.451	9.35	104.757	10.48
20	.....	.....	65.708	6.58	78.599	7.86	91.407	9.15	104.131	10.42	116.772	11.68
21	.....	.....	69.045	6.91	82.604	8.27	96.079	9.61	109.471	10.95	122.780	12.28
22	.....	.....	72.383	7.24	86.609	8.67	100.752	10.08	114.811	11.49	128.787	12.88
24	.....	.....	.....	....	94.619	9.47	110.097	11.01	125.491	12.55	140.802	14.09
26	.....	.....	.....	....	102.629	10.27	119.442	11.95	136.172	13.62	152.818	15.29
28	.....	.....	.....	....	.....	.....	128.787	12.88	146.852	14.69	164.833	16.49
30	.....	.....	.....	....	.....	.....	138.132	13.82	157.532	15.76	176.84	17.69

O. D. Size, Inches	Thickness, Inches											
	5/8		11/16		3/4		7/8		1		1 1/8	
	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot	Weight, Lbs.	Per Foot
14	89.279	$8.93	97.748	$9.78	106.134	$10.62	122.654	$12.27	138.842	$13.89	154.695	$15.47
15	95.954	9.60	105.091	10.51	114.144	11.42	132.000	13.20	149.522	14.96	166.710	16.68
16	102.629	10.27	112.433	11.25	122.154	12.22	141.345	14.14	160.202	16.03	178.725	17.88
17	109.304	10.94	119.776	11.98	130.164	13.02	150.690	15.07	170.882	17.09	190.740	19.08
18	115.979	11.60	127.118	12.72	138.174	13.82	160.035	16.01	181.562	18.16	202.756	20.28
20	129.330	12.94	141.804	14.19	154.194	15.42	178.725	17.88	202.923	20.30	226.786	22.68
21	136.005	13.61	149.146	14.92	162.204	16.23	.....	.....	.....	.....	.....	.....
22	142.680	14.27	156.489	15.65	170.215	17.03	.....	.....	.....	.....	.....	.....
24	156.030	15.61	171.174	17.12	186.235	18.63	.....	.....	.....	.....	.....	.....
26	169.380	16.94	185.859	18.59	202.255	20.23	.....	.....	.....	.....	.....	.....
28	182.730	18.28	200.545	20.06	218.275	21.83	.....	.....	.....	.....	.....	.....
30	196.081	19.61	215.230	21.53	234.296	23.43	.....	.....	.....	.....	.....	.....

STANDARD STEEL AND IRON BOILER TUBES

List Adopted February, 1916.

LAP WELDED

External Diam., Inches	Standard Thickness		Weight Per Foot, Lbs.	Standard Thickness		One Extra Wire Gauge		Two Extra Wire Gauges		Three Extra Wire Gauges		Four Extra Wire Gauges	
	Birmingham Wire Gauge	Inches		Steel, Per Foot	Iron, Per Foot	Steel, Per Foot	Iron, Per Foot	Steel, Per Foot	Iron, Per Foot	Steel, Per Foot	Iron, Per Foot	Steel, Per Foot	Iron, Per Foot
1 3/4	13	.095	1.679	$0.22	$0.22	$0.26	$0.26	$0.28	$0.28	$0.31	$0.31	$0.34	$0.34
2	13	.095	1.932	.21	.21	.24	.24	.26	.26	.28	.28	.31	.31
2 1/4	13	.095	2.186	.24	.24	.27	.27	.29	.29	.32	.32	.35	.35
2 1/2	12	.109	2.783	.30	.30	.33	.33	.36	.36	.39	.39	.43	.43
2 3/4	12	.109	3.074	.34	.34	.37	.37	.40	.40	.44	.44	.48	.48
3	12	.109	3.365	.38	.38	.41	.41	.45	.45	.49	.49	.54	.54
3 1/4	11	.120	4.011	.45	.45	.49	.49	.53	.53	.59	.59	.63	.63
3 1/2	11	.120	4.331	.48	.48	.53	.53	.58	.58	.64	.64	.69	.69
3 3/4	11	.120	4.652	.52	.52	.57	.57	.62	.62	.68	.68	.74	.74
4	10	.134	5.532	.61	.61	.66	.66	.73	.73	.79	.79	.88	.88
4 1/2	10	.134	6.248	.69	.69	.75	.75	.83	.83	.89	.89	.99	.99
5	9	.148	7.669	.81	.81	.90	.90	.97	.97	1.08	1.08	1.17	1.17
6	8	.165	10.282	1.08	1.08	1.17	1.17	1.31	1.31	1.41	1.41	1.52	1.52
7	8	.165	12.044	1.27	1.27	1.38	1.38	1.54	1.54	1.66	1.66	1.78	1.78
8	8	.165	13.807	1.45	1.45	1.58	1.58	1.76	1.76	1.90	1.90	2.05	2.05
9	7	.180	16.955	1.78	1.78	1.99	1.99	2.15	2.15	2.31	2.31	2.50	2.50
10	6	.203	21.240	2.22	2.22	2.39	2.39	2.57	2.57	2.79	2.79	3.04	3.04
11	5	.220	25.329	2.63	2.63	2.84	2.84	3.07	3.07	3.35	3.35	3.53	3.53
12	..	.229	28.788	2.99	2.99	3.23	3.23	3.51	3.51	3.76	3.76	4.10	4.10
13	4	.238	32.439	3.36	3.36	3.64	3.64	3.98	3.98	4.19	4.19	4.72	4.72
14	..	.248	36.423	....	....	....	....	....	....	....	....	....	....
15	3	.259	40.775	....	....	....	....	....	....	....	....	....	....
16	..	.270	45.359	....	....	....	....	....	....	....	....	....	....

Tubes more than 4 gauges heavier than standard will be charged per pound.

CAST IRON FITTINGS
STANDARD—SCREWED

Fig. 3795

STRAIGHT ELBOWS

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.05	.05	.06	.08
Each, Galvanized	$0.10	.10	.12	.16
Each, R. & L.	$0.06	.06	.07	.09

Size, Inches	1	1 1/4	1 1/2	2	2 1/2	3
Each, Black	$0.10 1/2	.16	.20	.28	.50	.75
Each, Galvanized	$0.21	.32	.40	.56	1.00	1.50
Each, R. & L.	$0.12	.18	.23	.32	.60	.85

Size, Inches	3 1/2	4	4 1/2	5	6
Each, Black	$1.05	1.20	1.75	2.00	2.75
Each, Galvanized	$2.10	2.40	3.50	4.00	5.50

Size, Inches	7	8	9	10	12
Each, Black	$4.70	6.75	9.00	13.50	20.00
Each, Galvanized	$9.40	13.50	18.00	27.00	40.00

REDUCING ELBOWS

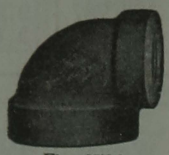


Fig. 3796

Size, Inches	3/8	1/2	3/4	1
Each, Black	$0.06	.07	.09	.12
Each, Galv.	$0.12	.14	.18	.24

Size, Inches	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Each, Black	$0.18	.23	.32	.60	.85	1.20
Each, Galvanized	$0.36	.46	.64	1.20	1.70	2.40

Size, Inches	4	4 1/2	5	6	7
Each, Black	$1.40	2.00	2.30	3.15	5.40
Each, Galvanized	$2.80	4.00	4.60	6.30	10.80

Size, Inches	8	9	10	12
Each, Black	$ 7.75	10.50	15.50	23.00
Each, Galvanized	$15.50	21.00	31.00	46.00

45° ELBOWS

Fig. 3797

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.06	.06	.07	.10
Each, Galv.	$0.12	.12	.14	.20

Size, Inches	1	1 1/4	1 1/2	2	2 1/2	3
Each, Black	$0.12	.19	.24	.34	.60	.90
Each, Galvanized	$0.24	.38	.48	.68	1.20	1.80

Size, Inches	3 1/2	4	4 1/2	5	6
Each, Black	$1.25	1.45	2.20	2.50	3.45
Each, Galvanized	$2.50	2.90	4.40	5.00	6.90

Size, Inches	7	8	9	10	12
Each, Black	$ 5.90	8.50	11.25	17.00	25.00
Each, Galvanized	$11.80	17.00	22.50	34.00	50.00

SIDE OUTLET ELBOWS

Fig. 3798

Size, Inches	1/2	3/4	1	1 1/4
Each, Black	$0.18	.24	.30	.48
Each, Galv.	$0.36	.48	.60	.96

Size, Inches	1 1/2	2	2 1/2	3	3 1/2	4
Each, Black	$0.60	.84	1.50	2.25	3.15	3.60
Each, Galvanized	$1.20	1.68	3.00	4.50	6.30	7.20

Size, Inches	4 1/2	5	6	7
Each, Black	$ 5.25	6.00	8.25	14.00
Each, Galvanized	$10.50	12.00	16.50	28.00

Size, Inches	8	9	10	12
Each, Black	$20.00	26.00	40.00	60.00
Each, Galvanized	$40.00	52.00	80.00	120.00

CAST IRON FITTINGS
STANDARD—SCREWED

Fig. 3799

STRAIGHT TEES

Size, Inches	1/4	3/8	1/2
Each, Black	$0.08	.08	.09
Each, Galv.	$0.16	.16	.18

Size, Inches	3/4	1	1 1/4	1 1/2	2
Each, Black	$0.12	.15	.23	.29	.41
Each, Galvanized	$0.24	.30	.46	.58	.82

Size, Inches	2 1/2	3	3 1/2	4	4 1/2	5
Each, Black	$0.73	1.10	1.50	1.75	2.55	3.00
Each, Galvanized	$0.46	2.20	3.00	3.50	5.10	6.00

Size, Inches	6	7	8	9	10	12
Each, Black	$4.00	6.80	9.75	13.00	19.50	29.00
Each, Galv.	$8.00	13.60	19.50	26.00	39.00	58.00

REDUCING TEES

Fig. 3800

Size, Inches	3/8	1/2	3/4	1
Each, Black	$0.09	.10	.14	.17
Each, Galv.	$0.18	.20	.28	.34

Size, Inches	1 1/4	1 1/2	2	2 1/2	3
Each, Black	$0.27	.33	.47	.83	1.25
Each, Galvanized	$0.54	.66	.94	1.66	2.50

Size, Inches	3 1/2	4	4 1/2	5	6
Each, Black	$1.75	2.00	2.95	3.50	4.60
Each, Galvanized	$3.50	4.00	5.90	7.00	9.20

Size, Inches	7	8	9	10	12
Each, Black	$ 7.80	11.25	15.00	22.50	33.50
Each, Galvanized	$15.60	22.50	30.00	45.00	67.00

SIDE OUTLET TEES

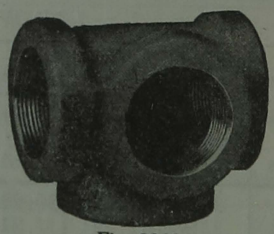


Fig. 3801

Size, Inches	1/2	3/4
Each, Black	$0.27	.36
Each, Galvanized	$0.54	.72

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Black	$0.45	.70	.90	1.25	2.25
Each, Galvanized	$0.90	1.40	1.80	2.50	4.50

Size, Inches	3	3 1/2	4	4 1/2	5	6
Each, Black	$3.25	4.50	5.25	7.65	9.00	12.00
Each, Galv.	$6.50	9.00	10.50	15.30	18.00	24.00

Size, Inches	7	8	9	10	12
Each, Black	$20.00	30.00	40.00	50.00	90.00
Each, Galvanized	$40.00	60.00	80.00	100.00	180.00

ECCENTRIC TEES

The object of these fittings is to prevent lodging places for water. It is believed that the lodgment of water causes pipe to eat away by rust. Inquiries and orders should have sketch showing exact position fitting is to be placed. Prices on application.

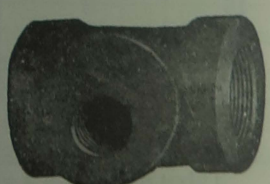


Fig. 3802

CAST IRON FITTINGS

STANDARD—SCREWED

Fig. 3803

STRAIGHT CROSSES

Size, Inches	½	¾	1
Each, Black	$0.16	.22	.27
Each, Galvanized	0.32	.44	.54

Size, Inches	1¼	1½	2	2½	3
Each, Black	$0.42	.53	.75	1.30	2.00
Each, Galvanized	$0.84	1.06	1.50	2.60	4.00

Size, Inches	3½	4	4½	5	6
Each, Black	$2.70	3.15	4.60	5.50	7.25
Each, Galvanized	$5.40	6.30	9.20	11.00	14.50

Size, Inches	7	8	9	10	12
Each, Black	$12.25	17.50	23.50	35.00	52.50
Each, Galvanized	$24.50	35.00	47.00	70.00	105.00

REDUCING CROSSES

Size, Inches	½	¾	1
Each, Black	$0.18	.25	.30
Each, Galvanized	$0.36	.50	.60

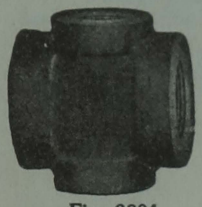


Fig. 3804

Size, Inches	1¼	1½	2	2½
Each, Black	$0.46	.60	.83	1.45
Each, Galvanized	$0.92	1.20	1.66	1.90

Size, Inches	3	3½	4	4½	5	6
Each, Black	$2.20	3.00	3.50	5.10	6.00	8.00
Each, Galvanized	$4.40	6.00	7.00	10.20	12.00	16.00

Size, Inches	7	8	9	10	12
Each, Black	$13.50	19.25	26.00	38.50	58.00
Each, Galvanized	$27.00	38.50	52.00	77.00	116.00

Fig. 3805

Y BRANCHES

STRAIGHT AND REDUCING—BLACK*

Size, Inches	½	¾	1
Straight, Each	$0.20	.28	.34
Reducing, Each	$0.23	.33	.40

Size, Inches	1¼	1½	2	2½	3
Straight, Each	$0.54	.66	.94	1.66	2.50
Reducing, Each	$0.62	.76	1.08	1.90	2.90

Size, Inches	3½	4	4½	5	6
Straight, Each	$3.50	4.00	5.90	7.00	9.20
Reducing, Each	$4.00	4.60	6.65	8.00	10.60

Size, Inches	7	8	10	12
Straight, Each	$15.60	22.50	45.00	67.00
Reducing, Each	$18.00	26.00	51.75	

*Galvanized Y Bends take double the above list.

BACK OUTLET RETURN BENDS

Size, Inches	¾	1
Center to Center, Inch.	1⅞	2¼
Each, R. H., Black	$0.38	.42
Each, R. H., Galv	$0.76	.84
Each, R. & L., Black	$0.42	.48

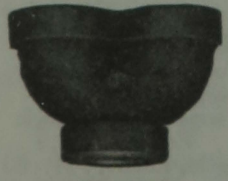


Fig. 3806

Size, Inches	1¼	1½	2	2½	3
Center to Center, Inches	2¼	2½	3¼	3¾	4¼
Each, R. H., Black	$0.60	.80	1.15	2.00	3.00
Each, R. H., Galvanized	$1.20	1.60	2.30	4.00	6.00
Each, R. & L., Black	$0.70	.95	1.30	2.30	3.50

CAST IRON FITTINGS

STANDARD—SCREWED

Fig. 3807

CLOSE PATTERN—RETURN BENDS

Close pattern return bends will not make up a parallel coil, as the distance, center to center, of two adjacent bends, is greater than the distance, center to center, of a single bend.

Size, Inches	½	¾	1	1¼
Center to Center, Inches	1¼	1½	1¾	2¼
Each, R. H., Black	$0.18	.20	.22	.28
Each, R. H., Galvanized	$0.36	.40	.44	.56
Each, R. & L., Black	$0.21	.23	.26	.33
Each, L. H., Black	$0.21	.23	.26	.33
Each, R. H., Pitched			$0.26	.33

Size, Inches	1½	2	2½	3	4
Center to Center, Inches	2½	3¼	3¾	4¼	6
Each, R. H., Black	$0.40	.57	1.20	1.70	5.00
Each, R. H., Galvanized	$0.80	1.14	2.40	3.40	10.00
Each, R. & L., Black	$0.46	.66	1.40	1.95	5.25
Each, L. H., Black	$0.46	.66	1.40	1.95	5.25

*Pitched R. & H. Bends are suitable for coils; 1 inch for 3 to 8 feet of pipe to coil; 1¼ for 4 to 6 feet of pipe to coil. R. & L. Pitched are made to order.

OPEN PATTERN RETURN BENDS

Size, Inches	¾	1
Cen. to Cen., Ins.	1⅞	2⅜
Each, R.H., Black	$0.26	.30
Each, R.H., Galv.	$0.52	.60
Each, R.&L., Black	$0.30	.35

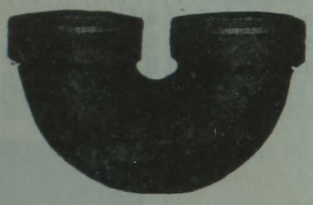


Fig. 3808

Size, Inches	1¼	1½	2	2½	3	4
Center to Center, Ins.	3	3½	4½	5½	6½	7½
Each, R. H., Black	$0.40	.55	.80	1.35	2.20	6.50
Each, R. H., Galv	$0.80	1.10	1.60	2.70	4.40	10.00
Each, R. & L., Black	$0.46	.64	.92	1.55	2.50	.....

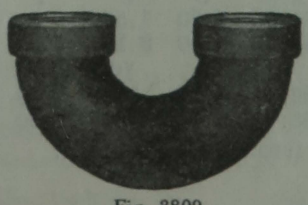


Fig. 3809

WIDE PATTERN RETURN BENDS RIGHT HAND

Size, Inches	1	1	1	1	1	1¼
Center to Center, Inches	3	4	5	6	8	4
Each, Black	$0.45	.50	.60	.75	1.00	1.00
Each, Galvanized	$0.80	.90	1.10	1.30	1.60	1.75

Size, Inches	1¼	1¼	1½	1½	1½
Center to Center, Inches	6	8	4⅞	6	8
Each, Black	$1.25	2.75	1.30	1.60	2.00
Each, Galvanized	$2.00	3.75	2.30	2.60	3.25

Size, Inches	2	2	2	2	4
Center to Center, Inches	4⅞	6	7	8	11
Each, Black	$1.75	2.00	3.00	3.50	7.50
Each, Galvanized	$3.00	3.25	4.50	5.00	11.00

CAST IRON FITTINGS

STANDARD—SCREWED

REDUCERS

Fig. 3810

Size, Inches	2	2½	3
Each, Black	$0.43	.60	.80
Each, Galvanized	$0.86	1.20	1.60

Size, Inches	3½	4	4½	5	6
Each, Black	$1.00	1.35	1.85	2.00	2.70
Each, Galvanized	$2.00	2.70	3.70	4.00	5.40

Size, Inches	7	8	9	10	12
Each, Black	$5.35	6.75	8.35	10.00	15.00
Each, Galvanized	$10.70	13.50	16.70	20.00	30.00

The list price of reducing fittings is determined by the largest opening.

OFFSETS—BLACK*

Fig. 3811

Size, Inches	¾	1
Each, to Offset 4 Inches	$0.45	.70
Each, to Offset 6 Inches	$0.67	1.05
Each, to Offset 8 Inches	$0.90	1.40

Size, Inches	1¼	1½	2	2½	3
Each, to Offset 4 Inches	$1.00	1.20	1.80	3.00	4.00
Each, to Offset 6 Inches	$1.50	1.80	2.70	4.50	6.00
Each, to Offset 8 Inches	$2.00	2.40	3.60	6.00	8.00

Size, Inches	3½	4	5	6
Each, to Offset 4 Inches	$5.00	6.00	8.00	10.00
Each, to Offset 6 Inches	$7.50	9.00	12.00	15.00
Each, to Offset 8 Inches	$10.00	12.00	16.00	20.00

* Galvanized offsets take double the above list.

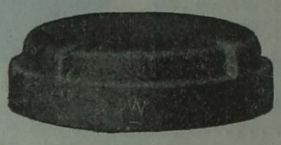


Fig. 3812

CAPS

Size, Inches	2½	3	3½	4
Each, Black	$0.40	.54	.75	.87
Each, Galvanized	$0.80	1.08	1.50	1.74

Size, Inches	4½	5	6	7
Each, Black	$1.05	1.20	1.55	2.50
Each, Galvanized	$2.10	2.40	3.10	5.00

Size, Inches	8	9	10	12
Each, Black	$2.85	4.75	5.50	7.00
Each, Galvanized	$5.70	9.50	11.00	14.00

Sizes smaller than 2½ inches furnished in malleable.

Fig. 3813

LOCKNUTS

Size, Inches	2½	3	3½	4
Each, Black	$0.27	.34	.47	.64
Each, Galvanized	$0.54	.68	.94	1.28

Size, Inches	4½	5	6	7
Each, Black	$0.85	.90	1.30	1.70
Each, Galvanized	$1.70	1.80	2.60	3.40

Sizes, Inches	8	9	10	12
Each, Black	$2.35	2.70	3.00	8.00
Each, Galvanized	$4.70	5.40	6.00	8.00

Sizes smaller than 2½ inches furnished in malleable.

CAST IRON FITTINGS

STANDARD

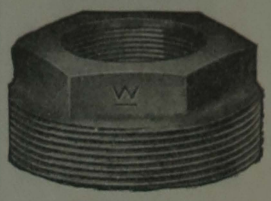


Fig. 3814

Bushings reducing one size only, up to and including 2½ inches, are malleable, and are listed among Malleable Fittings. The list price of Bushings is determined by the male thread size.

BUSHINGS

Size, Inches	⅜	½	¾	1	1¼
Each, Black	$0.04		.05	.06	.07
Each, Galvanized	$0.08		.10	.12	.14

Size, Inches	1½	2	2½	3
Each, Black	$0.09	.14	.21	.30
Each, Galvanized	$0.18	.28	.42	.60

Size, Inches	3½	4	4½	5	6
Each, Black	$0.40	.50	.75	.93	1.25
Each, Galvanized	$0.80	1.00	1.50	1.85	2.50

Size, Inches	7	8	9	10	12
Each, Black	$1.87	2.75	3.25	3.75	5.00
Each, Galvanized	$3.75	5.50	6.50	7.50	10.00

RADIATOR BUSHINGS

Fig. 3815

Size, Inches	1x¾	1¼x1
Each, Black	$0.09	.11

Size, Inches	1½x½	1½x¾	1½x1	1½x1¼
Each, Black	$0.14	0.14	.14	.14

Size, Inches	2x¾	2x1	2x1¼	2x1½
Each, Black	$0.21	.21	.21	.21

CAST IRON PLUGS

Fig. 3816

Size, Inches	⅛	¼	⅜	½
Each, Black	$0.02	.02	.02	.02
Each, Galvanized	$0.04	.04	.04	.04

Size, Inches	¾	1	1¼	1½	2
Each, Black	$0.03	.04	.05	.07	.10
Each, Galv.	$0.06	.08	.10	.14	.20

Size, Inches	2½	3	3½	4	4½	5
Each, Black	$0.18	.25	.38	.42	.65	.88
Each, Galvanized	$0.36	.50	.76	.84	1.30	1.75

Size, Inches	6	7	8	9	10	12
Each, Black	$1.20	1.85	2.75	3.25	3.75	5.00
Each, Galvanized	$2.40	3.70	5.50	6.50	7.50	10.00

⅛ to 6 inch sizes have square heads; 7 to 12 inch, hexagon heads.

SPECIAL PLUGS

Size, Inches	½	¾	1	1¼	1½	2
Countersunk, Each	$.004	.06	.08	.09	.11	.15
Left-Hand, Each	$0.06	.08	.09	.11	.15	
Tapped for Air Cock Each	$0.12	.15	.20	.25	.30	
Solid, Each	$0.04	.04	.04	.06	.08	.09	.11	.15

Size, Inches	2½	3	3½	4	4½	5	6
Countersunk, Each	$.30	.40	.92	1.10	....	2.00	3.50
Left-Hand, Each	...	...	...	...	....	....	....
Tapped for Air Cock Each	...	...	...	...	....	....	....
Solid, Each	$0.27	.38	.57	.63	1.00	1.35	1.80

CAST IRON FITTINGS

EXTRA HEAVY—SCREWED

FOR STEAM WORKING PRESSURES TO 250 LBS.

Fig. 3817

Fig. 3818

Size, Inches	½	¾	1	1¼
Elbows, Each	$0.25	.30	.35	.45
Reducing Elbows, Each	....	.40	.45	.55
45° Elbows, Each	$0.35	.40	.44	.55

Size, Inches	1½	2	2½	3
Elbows, Each	$0.60	.75	1.25	2.00
Reducing Elbows, Each	$0.75	.95	1.55	2.50
45° Elbows, Each	$0.70	.90	1.50	2.50

Size, Inches	3½	4	4½	5
Elbows, Each	$2.75	.50	4.25	5.50
Reducing Elbows, Each	....	$4.40	....	6.80
45° Elbows, Each	$3.50	4.50	5.50	6.75

Size, Inches	6	7	8	10	12
Elbows, Each	$8.00	12.00	17.00	28.00	40.00
Reducing Elbows, Each	....	....	....	....	....
45° Elbows, Each, Black	$9.75	14.50	21.00	34.00	48.00

Lists are for black only, galvanized elbows take double the above list.

The list price of reducing fittings is determined by the largest opening.

Fig. 3819

Fig. 3820

Size, Inches	½	¾	1	1¼
Tees, Each	$0.40	.45	.55	.70
Reducing, Tees, Each	....	$.60	.70	.90
Crosses, Each	....	....	$.70	.90
Y Bends, Each	....	....	....	$1.35

Plugs, Each	$0.04	.06	.08	.09
Size, Inches	1½	2	2½	3
Tees, Each	$0.90	1.15	1.80	3.00
Reducing Tees, Each	$1.15	1.40	2.25	3.75
Crosses, Each	$1.20	1.50	2.50	4.00
Y Bends, Each	$1.80	2.25	3.75	6.00
Plugs, Each	$0.11	.15	.27	.38

Size, Inches	3½	4	4½	5
Tees, Each	$4.25	5.50	6.75	8.25
Reducing Tees, Each	$6.30	6.85	8.50	10.25
Crosses, Each	$5.50	7.00	8.50	11.00
Y Bends, Each	....	$11.00	....	....
Plugs, Each	$0.57	.63	1.00	1.35

Size, Inches	6	7	8	10	12
Tees, Each	$12.00	18.00	25.00	42.00	60.00
Reducing Tees, Each	$15.00	22.50	3.100	52.00	75.00
Crosses, Each	$16.00	24.00	34.00	56.00	80.00
Y Bends, Each	$24.00	36.00	50.00	....	....
Plugs, Each	$ 1.80	....	....	....	....

Lists are for black only, galvanized elbows take double the above list.

LONG SWEEP CAST IRON FITTINGS

STANDARD—SCREWED

For steam working pressures up to 125 Lbs., and for water working pressures up to 150 Lbs.

Fig. 3821

No. 1 Elbow

Fig. 3822

No. 2 Double Branch

NO. 1 ELBOWS*

Size, Inches	¾	1	1½	1½	2
Each, Black	$0.26	.32	.40	.55	.80
Each, Galvanized	$0.52	.64	.80	1.10	1.60
Reducing, Each, Black	$0.40	.48	.60	.83	1.20

Size, Inches	2½	3	3½	4
Black, Each	$1.20	2.25	3.25	3.50
Each, Galvanized	$2.40	4.50	6.50	7.00
Reducing, Each, Black	$1.80	3.38	4.88	5.25

Size, Inches	4½	5	6	7
Each, Black	$5.50	6.50	8.75	13.00
Each, Galvanized	$11.00	13.00	17.50	26.00
Reducing, Each, Black	$8.25	9.75	13.13	19.50

Size, Inches	8	9	10	12
Each, Black	$17.00	25.50	30.00	40.00
Each, Galvanized	$34.00	51.00	60.00	80.00
Reducing, Each, Black	$25.50	38.25	45.00	60.00

*No. 2 Double Branch Elbows take double the list of No. 1.

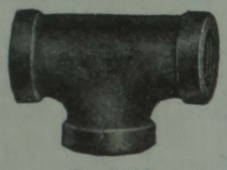


Fig. 3823

NO. 5 TEES

Size, Inches	1	1¼	1½	2
Center to Face, Inches	2¼	2⅝	3	3⅝
Each, Black	$0.64	.80	1.10	1.60
Reducing, Each, Black	$0.96	1.20	1.65	2.40

Size, Inches	2½	3	3½	4
Center to Face, Inches	4¾	5½	5¾	6⅛
Each, Black	$2.40	4.50	6.50	7.00
Reducing, Each, Black	$3.60	6.75	9.75	10.50

Size, Inches	4½	5	6	7
Center to Face, Inches	6¼	7	7½	8⅞
Each, Black	$11.00	13.00	17.50	26.00
Reducing, Each, Black	$16.50	19.50	26.25	39.00

Size, Inches	8	9	10	1¾
Center to Face, Inches	9½	10¾	11½	122
Each, Black	$34.00	51.00	60.00	80.00
Reducing, Each, Black	$51.00	76.50	90.00	120.00

Galvanized fittings take double the above list.

CAST IRON FITTINGS
LONG SWEEP
STANDARD—SCREWED

For steam working pressure up to 125 pounds.

Fig. 3824

NO. 3 TEES

Size, Inches	1	1¼	1½
Black, Each	$0.48	.60	.82
Galv., Each	$0.96	1.20	1.64
Reduc., Blk., Each	$0.72	.90	1.23

Size, Inches	2	2½	3	3½
Black, Each	$1.20	1.80	3.40	4.90
Galvanized, Each	$2.40	3.60	6.80	9.80
Reducing, Black, Each	$1.80	2.70	5.10	7.35

Size, Inches	4	4½	5	6
Black, Each	$ 5.25	8.25	9.75	13.25
Galvanized, Each	$10.50	16.50	19.50	26.50
Reducing, Black, Each	$ 7.88	12.58	14.63	19.88

Size, Inches	7	8	9	10	12
Black, Each	$19.50	25.50	38.00	45.00	60.00
Galvanized, Each	$39.00	51.00	76.00	90.00	120.00
Reducing, Black, Each	$29.25	38.25	57.00	67.50	90.00

NO. 4 CROSSES

Single or Double Sweep

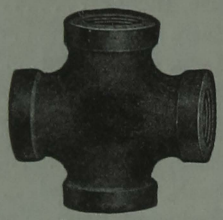


Fig. 3825

Size, Inches	1	1¼	1½
Black, Each	$0.85	1.10	1.50
Galv., Each	$1.70	2.20	3.00
Reduc., Blk., Each	$1.28	1.65	2.25

Size, Inches	2	2½	3	3½
Black, Each	$2.15	3.20	6.00	8.75
Galvanized, Each	$4.30	6.40	12.00	17.50
Reducing, Black, Each	$3.23	4.80	9.00	13.13

Size, Inches	4	5	6	7
Black, Each	$ 9.50	17.50	24.00	35.00
Galvanized, Each	$19.00	35.00	48.00	70.00
Reducing, Black, Each	$14.25	26.25	36.00	52.50

Size, Inches	8	9	10	12
Black, Each	$45.00	68.00	80.00	107.00
Galvanized, Each	$90.00	136.00	160.00	214.00
Reducing, Black, Each	$67.50	102.00	120.00	160.50

CAST IRON SPRINKLER FITTINGS
LONG TURN—STANDARD

For water working pressure up to 150 Lbs.

FLANGED ELBOWS

Fig. 3826

Size, Inches	Each Black, Flange One End	Each Black, Flange Two Ends
2	$5.00	$6.00
2½	5.50	6.75
3	6.00	7.50
3½	6.50	8.50
4	7.50	10.00
5	10.00	12.50
6	14.00	17.50
7	25.00	30.00
8	30.00	35.00
10	40.00	50.00
12	53.00	65.00

Note.—For size of flanges, see templates for drilling.

CAST IRON SPRINKLER FITTINGS
LONG TURN—STANDARD

For water working pressure up to 150 pounds.

Fig. 3827

ELBOWS WITH BASE

Size, Inches	Black, Each	Size, Inches	Black, Each
3	$8.00	7	$25.00
4	11.00	8	32.00
4½	14.00	9	40.00
5	15.00	10	50.00
6	18.00	12	65.00

STRAIGHT BACK TEES

Size, Inches	Black, Each—Straight	Black, Each—Reducing
2	$1.60	$2.40
2½	2.40	3.60
3	4.50	6.75
3½	6.50	9.75
4	7.00	10.50
4½	11.00	16.50
5	13.00	19.50
6	17.50	26.25
7	26.00	39.00

Fig. 3828

Size, Inches	Black, Each—Straight	Black, Each—Reducing
8	$34.00	$51.00
9	51.00	76.50
10	60.00	90.00
12	80.00	120.00

Galvanized, take double the above list.

The list price of reducing fittings is determined by the largest opening.

TEES WITH BASE

Made to order only.

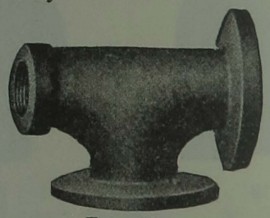


Fig. 3829

FLANGED TEES

Size, Inches	Black, Each—Flange 1 or 2 Ends	Black, Each—Flange 3 Ends	Size, Inches	Black, Each—Flange 1 or 2 Ends	Black, Each—Flange 3 Ends
2	$8.00	$9.00	6	$22.00	$26.00
2½	9.00	10.00	7	40.00	45.00
3	10.00	11.50	8	45.00	50.00
3½	11.00	13.00	10	80.00	90.00
4	12.00	15.00	12	105.00	120.00
5	15.00	18.00	...	.....	.....

FLANGED CROSSES

Size Inches	Black, Each—Flange 1 or 2 Ends	Black, Each—Flange 3 or 4 Ends	Size Inches	Black, Each—Flange 1 or 2 Ends	Black, Each—Flange 3 or 4 Ends
2	$11.00	$12.00	6	$30.00	$35.00
2½	12.50	13.50	7	55.00	60.00
3	13.50	15.00	8	65.00	70.00
3½	15.00	17.00	10	100.00	120.00
4	17.00	20.00	12	132.00	157.00
5	22.00	25.00	.....	.....	.....

In ordering, specify which ends are to be flanged or send sketch.

Prices on these long turn fittings include the facing and drilling of flanges.

STANDARD CAST IRON FITTINGS

BRANCH TEES

Fig. 3830

NO. 1—Branch Tees with open run, for circulation. All openings tapped right hand.

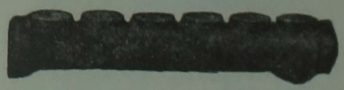


Fig. 3831

NO. 2—Branch tees with one end open and an outlet in back, for circulation. All openings tapped right hand.

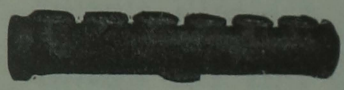


Fig. 3832

NO. 3—Branch tees with both ends closed, for box coils, inlet in back; branch openings left hand, back inlet right hand. The run and back openings of branch tees are always tapped the same size as branches, unless otherwise ordered.

Number of Branches	1-Inch Branch Tee 2½ Inches Center to Center — Size of Run, Inches			1¼-Inch Branch Tee 3 Inches Center to Center — Size of Run, Inches		
	1 or 1¼	1½	2	1¼ or 1½	2	2½
2	$0.90	$1.00	$1.15	$1.30	.....	.....
3	1.05	1.15	1.35	1.65	$1.90	$2.40
4	1.15	1.30	1.60	2.00	2.40	2.85
5	1.35	1.45	1.85	2.40	2.90	3.55
6	1.60	1.75	2.10	2.80	3.30	3.95
7	1.90	2.20	2.45	3.20	3.90	4.20
8	2.20	2.45	2.75	3.60	4.50	4.95
9	2.65	2.90	3.40	4.30	5.25	6 14
10	.....	3.30	4.00	4.80	5.85	6.85
11	.....	4.50	4.80	5.00	6.25	7.25
12	.....	4.75	5.10	5.25	6.50	7.65
13	.....	5.50	6.00	6.00	7.00	8.25
14	.....	7.00	7.25	6.75	7.75	9.00
15	.....	7.50	7.75	7.50	8.50	9.75
16	.....	8.00	8.25	8.50	9.50	10.75

Number of Branches	1½-Inch Branch Tee 3½ Inches Center to Center — Size of Run, Inches			2-Inch Branch Tee 4½ Inches Center to Center — Size of Run, Inches		
	½ or 2	2½	3	2	2½ or 3	3½
2	$2.10	.....	.....	$4.10	.....	.....
3	2.70	$3.45	$3.80	5.25	$5.75	$6.25
4	3.25	4.15	4.60	6.40	7.00	7.75
5	4.00	5.00	5.50	7.65	8.50	9.25
6	4.65	5.75	6.25	8.80	9.75	10.75
7	5.25	6.50	7.25	10.60	11.75	13.00
8	5.85	7.00	7.75	11.50	12.75	14.00
9	6.50	8.25	9.00	12.25	13.50	15.00
10	7.60	9.25	10.00	13.50	15.00	16.50
11	8.00	9.75	10.75	.....	.....	.....
12	8.50	10.50	11.50	.....	.....	.....

Back or side outlets charged as additional front outlets.

1-inch branch tees, 1-inch or 1¼-inch run, are 1¾ inches inside diameter.

1-inch branch tees, 1½-inch or 2-inch run, are 2¼ inches inside diameter.

1¼-inch branch tees are all 2¼ inches inside diameter.

1½-inch branch tees are all 2¾ inches inside diameter.

2-inch branch tees are all 3½ inches inside diameter.

Always order branch tees by size and number.

DIMENSIONS STANDARD WEIGHT CAST IRON SCREWED FITTINGS

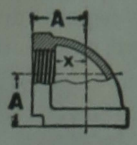


Fig. 3833

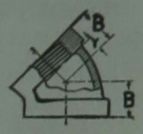


Fig. 3834

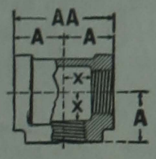


Fig. 3835

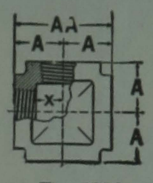


Fig. 3836

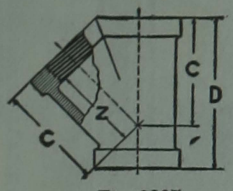


Fig. 3837

Size, Inches	1/4	3/8	1/2	3/4	1
A-Center to Face, Inches	3/4	7/8	1 1/16	1 5/16	1 1/2
AA-Face to Face, Inches	1 1/2	1 3/4	2 1/8	2 5/8	3
B-Center to Face, Inches	7/16	9/16	11/16	13/16	15/16
C-Center to Face, Inches		1 7/16	1 7/8	2 1/16	2 1/2
D-Face to Face, Inches		2 1/16	2 9/16	2 3/4	3 1/4
E-O.D. of Bead, Inches	1	1 1/8	1 7/16	1 3/4	2 1/16
F-Width of Bead, Inches	1/4	5/16	3/8	7/16	1/2
G-Thread Length, Inches	3/8	7/16	1/2	9/16	5/8

Size, Inches	1 1/4	1 1/2	2	2 1/2	3
A-Center to Face, Inches	1 13/16	2	2 3/8	2 7/8	3 5/16
AA-Face to Face, Inches	3 5/8	4	4 3/4	5 3/4	6 5/8
B-Center to Face, Inches	1 1/16	1 3/16	1 3/8	1 5/8	1 7/8
C-Center to Face, Inches	3	3 1/4	4	5	5 5/8
D-Face to Face, Inches	3 3/4	4 3/4	5 1/2	6 13/16	7 5/8
E-O.D. of Bead, Inches	2 1/2	2 3/4	3 3/8	4 1/8	4 3/4
F-Width of Bead, Inches	9/16	5/8	11/16	13/16	15/16
G-Thread Length, Inches	11/16	13/16	7/8	1	1

Size, Inches	3 1/2	4	4 1/2	5	6
A-Center to Face, Inches	3 11/16	4	4 7/16	4 11/16	5 5/16
AA-Face to Face, Inches	7 3/8	8	8 7/8	9 3/8	10 5/8
B-Center to Face, Inches	2 1/16	2 1/4	2 7/16	2 9/16	2 13/16
C-Center to Face, Inches	6 3/8	7 1/8	7 7/8	8 1/2	9 15/16
D-Face to Face, Inches	8 3/4	9 3/4	10 1/2	11 5/16	13 1/8
E-O.D. of Bead, Inches	5 1/4	6	6 9/16	7 1/16	8 3/8
F-Width of Bead, Inches	1	1 1/16	1 1/8	1 1/8	1 1/8
G-Thread Length, Inches	1 1/16	1 1/8	1 1/4	1 1/4	1 3/8

Size, Inches	7	8	9	10	12
A-Center to Face, Inches	6 1/16	6 13/16	7 1/2	8 1/4	9 9/16
AA-Face to Face, Inches	12 1/8	13 5/8	15	16 1/2	19 1/8
B-Center to Face, Inches	3 1/8	3 9/16	3 7/8	4 5/16	4 7/8
C-Center to Face, Inches	11 1/4	12 15/16	14 1/2	16	....
D-Face to Face, Inches	14 5/8	16 13/16	19	20 7/8	....
E-O.D. of Bead, Inches	9 3/4	10 7/8	12 1/8	13 1/4	15 5/8
F-Width of Bead, Inches	1 3/8	1 3/8	1 11/16	1 5/8	1 3/4
G-Thread Length, Inches	1 1/2	1 5/8	1 3/4	1 3/4	1 7/8

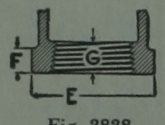


Fig. 3838

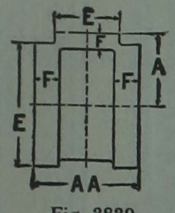


Fig. 3839

The center to face and face to face dimensions of reducing tees and crosses are determined as follows: For AA-Face to Face, add to the outside diameter E of outlet bead twice the width F of the run bead.

For A-center to face, add to the width F of outlet bead one-half the diameter E of the run-bead.

For example, AA of a 2x¾ tee

equals $1\frac{3}{4}+\frac{11}{16}+\frac{11}{16}=3\frac{1}{8}$ inches.

$A=\frac{7}{16}+1\frac{1}{16}=2\frac{1}{8}$ inches.

LIST OF SIZES OF STANDARD CAST IRON SCREWED FITTINGS

In arranging the order of Cast Iron Fittings we will use the following rule: For example, it is well known the largest opening, either in the run or branch, determines the size of the fitting. A ¾x¾x1¼ Tee will, therefore, be found amongst the 1¼ inch fittings. Of course, these remarks apply to all sizes and combinations.

In describing fittings, the run is first named, then the outlet.

ELBOWS

Size, Inches	Size, Inches	Size, Inches	Size, Inches	Size, Inches
¼x ¼	1¼x1¼	2 x ¾	3½x2½	5x2½
⅜x ⅜	1¼x1	2½x2½	3½x2	6x6
⅜x ¼	1¼x ¾	2½x2	4 x4	6x5
½x ½	1¼x ½	2½x1½	4 x3½	6x4
½x ⅜	1¼x ⅜	2½x1¼	4 x3	7x7
½x ¼	1½x1½	2½x1	4 x2½	7x6
¾x ¾	1½x1¼	3 x3	4 x2	8x8
¾x ½	1½x1	3 x2½	4½x4½	8x7
¾x ⅜	1½x ¾	3 x2	4½x4	8x6
1 x1	2 x2	3 x1½	5 x5	9x9
1 x ¾	2 x1½	3 x1¼	5 x4½	10x10
1 x ½	2 x1¼	3½x3½	5 x4	10x8
1 x ⅜	2 x1	3½x3	5 x3	12x12

45°

Size, Inches	
¼	3½
⅜	4
½	4½
¾	5
1	6
1¼	7
1½	8
2	9
2½	10
3	12

60° and 22°

Size, Inches
½
¾
1
1¼
1½
2
2½
3
4
5

Pitched,

Size, Inches	
½	2x1½
¾x ½	2
¾	2½x2
1 x ¾	2½
1	3 x2½
1¼x1	2
1¼	3½x3
1½x1	3½
1½x ¼	4
1½	

R. and L.

Size, Inches
¼
⅜
½
¾
1
1¼
1½
2
2½
3

TEES

Fig. 3840

In describing Tees, the run is first named, then the outlet, thus:

½T½ = ½x¾ / ¾

½T⅜ = ½x⅜x¾ / ¾

Fig. 3841

Size, Inches	Size, Inches	Size, Inches	Size, Inches
¼x ¼x ¼	1 x ½x ¾	1½x1½x1	2x2 x1½
⅜x ⅜x ⅜	1 x ½x ½	1½x1½x ¾	2x2 x1¼
⅜x ⅜x ¼	1 x ⅜x1	1½x1½x ½	2x2 x1
½x ½x ½	1 x ¼x1	1½x1¼x1½	2x2 x ¾
½x ½x ⅜	¾x ¾x1	1½x1¼x1¼	2x2 x ½
½x ½x ¼	¾x ½x1	1½x1¼x1	2x2 x ¼
½x ⅜x ½	½x ½x1	1½x1¼x ¾	2x1½x2
½x ⅜x ⅜	1¼x1¼x1¼	1½x1¼x ½	2x1½x1½
⅜x ⅜x ½	1¼x1¼x1	1½x1 x1½	2x1½x1¼
¾x ¾x ¾	1¼x1¼x ¾	1½x1 x1¼	2x1½x1
¾x ¾x ½	1¼x1¼x ½	1½x1 x1	2x1½x ¾
¾x ¾x ⅜	1¼x1¼x ⅜	1½x1 x ¾	2x1½x ½
¾x ¾x ¼	1¼x1¼x ¼	1½x1 x ½	2x1¼x2
¾x ½x ¾	1¼x1 x1¼	1½x ¾x1½	2x1¼x1½
¾x ½x ½	1¼x1 x1	1½x ¾x1¼	2x1¼x1¼
¾x ⅜x ¾	1¼x1 x ¾	1½x ¾x1	2x1¼x1
¾x ⅜x ⅜	1¼x1 x ½	1½x ¾x ¾	2x1¼x ¾
¾x ¼x ¾	1¼x ¾x1¼	1½x ½x1½	2x1 x2
½x ½x ¾	1¼x ¾x1	1½x ½x1¼	2x1 x1½
1 x1 x1	1¼x ¾x ¾	1½x ⅜x1½	2x1 x1¼
1 x1 x ¾	1¼x ½x1¼	1¼x1¼x1½	2x1 x1
1 x1 x ½	1¼x ¼x1¼	1¼x1 x1½	2x1 x ¾
1 x1 x ⅜	1¼x ½x1	1¼x ¾x1½	2x ¾x2
1 x1 x ¼	1 x1 x1¼	1¼x ½x1½	2x ¾x1½
1 x ¾x1	1 x ¾x1¼	1 x1 x1½	2x ½x1½
1 x ¾x ¾	¾x ¾x1¼	1 x ¾x1½	2x ¼x2
1 x ¾x ½	1½x1½x1½	¾x ¾x1½	2x ½x2
1 x ½x1	1½x1½x1¼	2 x2 x2	

TEES

Size, Inches	Size, Inches	Size, Inches	Size, Inches
1½x1½x2	2½x2½x3	3½x3½x4	6x 3 x 6
1½x1¼x2	2½x2 x3	3 x3 x4	6x 2½x 6
1½x1 x2	2½x1½x3	2½x2½x4	6x 2 x 6
1½x ¾x2	2 x2 x3	2 x2 x4	5x 5 x 6
1¼x1¼x2	3½x3½x3½	4½x4½x4½	5x 3½x 6
1¼x1 x2	3½x3½x3	4½x4½x4	4x 4 x 6
1¼x ¾x2	3½x3½x2½	4½x4½x3½	7x 7 x 7
1 x1 x2	3½x3½x2	4½x4½x3	7x 7 x 6
1 x ¾x2	3½x3½x1½	4½x4½x2½	7x 7 x 5
¾x ¾x2	3½x3½x1¼	4½x4½x2	7x 7 x 4
2½x2½x2½	3½x3½x1	4½x4½x1½	7x 7 x 3½
2½x2½x2	3½x3½x ¾	4½x4½x1¼	7x 7 x 3
2½x2½x1½	3½x3 x3½	4½x4½x1	7x 7 x 2½
2½x2½x1¼	3½x3 x3	4½x4 x3	7x 7 x 2
2½x2½x1	3½x3 x2½	4½x4 x2	7x 6 x 7
2½x2½x ¾	3½x3 x2	5 x5 x5	7x 6 x 6
2½x2½x ½	3½x3 x1½	5 x5 x4½	7x 6 x 5
2½x2 x2½	3½x3 x1¼	5 x5 x4	7x 6 x 4
2½x2 x2	3½x3 x1	5 x5 x3½	7x 6 x 3
2½x2 x1½	3½x3 x ¾	5 x5 x3	7x 5 x 6
2½x2 x1¼	3½x2½x3½	5 x5 x2½	7x 5 x 5
2½x2 x1	3½x2½x3	5 x5 x2	6x 6 x 7
2½x2 x ¾	3½x2½x2½	5 x5 x1½	5x 5 x 7
2½x2 x ½	3½x2½x2	5 x5 x1¼	8x 8 x 8
2½x1½x2½	3½x2 x3½	5 x5 x1	8x 8 x 7
2½x1½x2	3½x1½x3½	5 x5 x ¾	8x 8 x 6
2½x1½x1½	3½x1¼x3½	5 x4 x5	8x 8 x 5
2½x1½x1¼	3½x1 x3½	5 x4 x4½	8x 8 x 4
2½x1½x1	3 x3 x3½	5 x4 x4	8x 8 x 3½
2½x1¼x2½	4 x4 x4	5 x4 x3½	8x 8 x 3
2½x1¼x2	4 x4 x3½	5 x4 x3	8x 8 x 2½
2½x1¼x1½	4 x4 x3	5 x4 x2½	8x 8 x 2
2½x1 x2½	4 x4 x2½	5 x4 x2	8x 8 x 1½
2½x1 x2	4 x4 x2	5 x4 x1½	8x 8 x 1¼
2½x ¾x2½	4 x4 x1½	5 x3½x3½	8x 7 x 8
2½x ½x2½	4 x4 x1¼	5 x3 x5	8x 7 x 6
2 x2 x2½	4 x4 x1	5 x3 x4½	8x 7 x 5
2 x1½x2½	4 x4 x ¾	5 x3 x4	8x 7 x 4
2 x1¼x2½	4 x3½x4	5 x3 x3½	8x 7 x 3
2 x1 x2½	4 x3½x3½	5 x3 x3	8x 6 x 8
2 x ¾x2½	4 x3½x3	5 x3 x2½	8x 6 x 7
1½x1½x2½	4 x3½x2½	5 x3 x2	8x 6 x 6
1½x1¼x2½	4 x3½x2	5 x2½x5	8x 5 x 8
1½x1 x2½	4 x3½x1½	5 x2½x4	8x 5 x 5
3 x3 x3	4 x3½x1¼	5 x2½x3	8x 4 x 8
3 x3 x2½	4 x3½x1	5 x2 x5	8x 4 x 6
3 x3 x2	4 x3 x4	5 x1½x5	9x 6 x 8
3 x3 x1½	4 x3 x3½	5 x1¼x5	9x 9 x 9
3 x3 x1¼	4 x3 x3	4 x4 x5	9x 9 x 7
3 x3 x1	4 x3 x2½	6 x6 x6	9x 9 x 6
3 x3 x ¾	4 x3 x2	6 x6 x5	9x 9 x 5
3 x3 x ½	4 x3 x1½	6 x6 x4½	10x10 x10
3 x2½x3	4 x3 x1¼	6 x6 x4	10x10 x 8
3 x2½x2½	4 x3 x1	6 x6 x3½	10x10 x 6
3 x2½x2	4 x3 x ¾	6 x6 x3	10x10 x 5
3 x2½x1½	4 x2½x4	6 x6 x2½	10x10 x 4
3 x2½x1¼	4 x2½x3½	6 x6 x2	10x10 x 3
3 x2½x1	4 x2½x3	6 x6 x1½	10x10 x 2
3 x2½x ¾	4 x2½x2½	6 x6 x1¼	10x 8 x 8
3 x2 x3	4 x2½x2	6 x6 x1	8x 8 x10
3 x2 x2½	4 x2½x1½	6 x5 x6	12x12 x12
3 x2 x2	4 x2½x1¼	6 x5 x5	12x12 x10
3 x2 x1½	4 x2½x1	6 x5 x4	12x12 x 8
3 x2 x1¼	4 x2 x4	6 x5 x3½	12x12 x 6
3 x2 x1	4 x2 x3	6 x5 x3	12x12 x 5
3 x1½x3	4 x2 x2½	6 x5 x2½	12x12 x 4
3 x1½x2½	4 x2 x2	6 x5 x1½	12x 8 x10
3 x1½x2	4 x1½x4	6 x4 x6	12x 8 x 8
3 x1¼x3	4 x1¼x4	6 x 4 x4	
3 x1 x3	4 x1 x4	6 x 4 x3	

LIST OF SIZES OF STANDARD CAST IRON SCREWED FITTINGS

In arranging the order of Cast Iron Fittings the following rule is used: For example, it is well known the largest opening, either in the run or branch, determines the size of the fitting. A ¾x¾x1¼ Tees will, therefore, be found amongst the 1¼ inch fittings. These remarks apply to all sizes and combinations.

In describing fittings, the run is first named, then the outlet.

Fig. 3842

CROSSES

Note.—In describing crosses, the run openings are first named and then the outlets.

Size, Inches	Size, Inches	Size, Inches
½x ½x ½x ½	2½x2 x1¼x1¼	4 x4 x2½x2½
¾x ¾x ¾x ¾	2½x2 x1¼x1	4 x4 x2 x2
¾x ¾x ½x ½	2½x2 x1 x1	4 x4 x2 x1½
¾x ½x ½x ½	2½x2 x1 x ¾	4 x4 x1½x1½
1 x1 x1 x1	2½x2 x ¾x ¾	4 x4 x1½x1¼
1 x1 x ¾x ¾	2½x1½x2 x1½	4 x4 x1½x1
1 x1 x ½x ½	2½x1½x1½x1	4 x4 x1¼x1¼
1 x ¾x ¾x ¾	2½x1½x1¼x1¼	4 x4 x1¼x1
1¼x1¼x1¼x1¼	3 x3 x3 x3	4 x4 x1 x1
1¼x1¼x1 x1	3 x3 x2½x2½	4 x3½x2½x2
1¼x1¼x ¾x¾	3 x3 x2 x2	4 x3½x2 x2
1¼x1¼x ½x ½	3 x3 x2 x1½	4 x3½x2 x1½
1¼x1 x1 x1	3 x3 x2 x1	4 x3½x2 x1¼
1¼x1 x ¾x ¾	3 x3 x1½x1½	4 x3½x1½x1½
1¼x ¾x ¾x ¾	3 x3 x1½x1¼	4 x3½x1½x1¼
1½x1½x1½x1½	3 x3 x1½x1	4 x3½x1¼x1¼
1½x1½x1¼x1¼	3 x3 x1½x ¾	4 x3½x1¼x1
1½x1½x1 x1	3 x3 x1¼x1¼	4½x4½x4½x4½
1½x1½x ¾x ¾	3 x3 x1¼x	5 x5 x5 x5
1½x1½x ½x ½	3 x3 x1¼x ¾	5 x5 x4 x4
1½x1¼x1¼x1¼	3 x3 x1 x1	5 x5 x3 x3
1½x1¼x1 x1	3 x3 x ¾x ¾	5 x5 x2½x2½
1½x1¼x ¾x¾	3 x2½x2½x2	5 x5 x2 x2
1½x1 x1 x ¾	3 x2½x2½x1½	5 x5 x2 x1½
1½x1 x1 x ½	3 x2½x2 x2	5 x5 x1½x1½
1½x1 x ¾x ¾	3 x2½x2 x1½	5 x5 x1½x1¼
2 x2 x2 x2	3 x2½x2 x1¼	5 x5 x1 x1
2 x2 x1½x1½	3 x2½x2 x1	5 x4 x2 x2
2 x2 x1¼x1¼	3 x2½x2 x ¾	5 x4 x2 x1½
2 x2 x1¼x1	3 x2½x1½x1½	5 x4 x1½x1½
2 x2 x1 x1	3 x2½x1½x1¼	5 x4 x1½x1¼
2 x2 x1 x ¾	3 x2½x1½x1	5 x4 x1¼x1
2 x2 x ¾x ¾	3 x2½x1¼x1¼	5 x4 x1 x1
2 x2 x ½x ½	3 x2½x1¼x1	6 x6 x6 x6
2 x1½x1½x1½	3 x2½x1 x1	6 x6 x5 x5
2 x1½x1¼x1¼	3 x2 x2 x2	6 x6 x4 x4
2 x1¼x1¼x1	3½x3½x3½x3½	6 x6 x3 x3
2 x1½x1 x1	3½x3½x3 x3	6 x6 x2½x2½
2 x1½x1 x ¾	3½x3½x2½x2½	6 x6 x2 x2
2 x1½x ¾x ¾	3½x3½x2 x2	6 x6 x2 x1½
2 x1¼x1 x ¾	3½x3½x2 x1½	6 x6 x1½x1½
2 x1 x1½x1	3½x3½x1½x1½	6 x5 x2 x2
2½x2½x2½x2½	3½x3½x1½x1¼	6 x5 x2 x1½
2½x2½x2 x2	3½x3½x1½x1	6 x5 x1½x1½
2½x2½x1½x1½	3½x3½x1¼x1¼	7 x7 x7 x7
2½x2½x1½x1¼	3½x3½x1¼x1	7 x7 x6 x6
2½x2½x1½x1	3½x3½x1 x1	7 x7 x5 x5
2½x2½x1¼x1¼	3½x3 x2½x2	8 x8 x8 x8
2½x2½x1¼x1	3½x3 x2 x2	8 x8 x7 x7
2½x2½x1¼x ¾	3½x3 x2 x1½	8 x8 x6 x6
2½x2½x1 x1	3½x3 x2 x1¼	8 x8 x5 x5
2½x2½x1 x ¾	3½x3 x1½x1½	8 x8 x4 x4
2½x2½x ¾x ¾	3½x3 x1½x1¼	9 x9 x9 x9
2½x2 x2 x1½	3½x3 x1½x1	10 x10 x10 x10
2½x2 x2 x1¼	3½x3 x1¼x1¼	10 x10 x8 x8
2½x2 x2 x1	3½x3 x1¼x1	10 x10 x7 x7
2½x2 x1½x1½	3½x3 x1 x1	12 x12 x12 x12
2½x2 x1½x1¼	4 x4 x4 x4	12 x12 x10 x10
2½x2 x1½x1	4 x4 x3½x3½	12 x12 x8 x8
2½x2 x1½x ¾	4 x4 x3 x3	

REDUCERS

Fig. 3843

Size, Inches	Size, Inches	Size, Inches	Size, Inches
4½x4	5x2½	6x3	8x 6
5 x4½	5x2	6x2½	8x 4
5 x4	6x5	6x2	10x 8
5 x3½	6x4	7x6	10x 6
5 x3	6x0½	8x7	12x10

Y BENDS

Size, Inches	Size, Inches	Size, Inches
½	2½	6
¾	3	7
1	3½	8
1¼	4	..
1½	4½	10
2	5	12

Fig. 3844

CAPS

Fig. 3845

Size, Inches	Size, Inches	Size, Inches
4	6	9
4½	7	10
5	8	12

PLUGS

Size, Inches	Size, Inches	Size, Inches
⅛	1½	5
¼	2	6
⅜	2½	7
½	3	8
¾	3½	9
1	4	10
1¼	4½	12

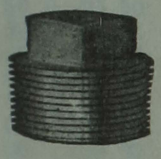


Fig. 3846

LOCK NUTS

Fig. 3847

Size, Inches	Size, Inches	Size, Inches
2½	4½	8
3	5	9
3½	6	10
4	7	12

ECCENTRIC COUPLINGS

Size, Inches	Size, Inches	Size, Inches
1¼x1	3 x1½	5x3½
1¼x ¾	3½x3	5x3
1½x1¼	3½x2½	5x2½
1½x1	3½x2	5x2
2 x1½	3½x1¼	6x5
2 x1¼	3½x1½	6x4
2 x1	4 x3½	6x3½
2 x ¾	4 x3	6x3
2½x2	4 x2½	6x2½
2½x1½	4 x2	7x6
2½x1¼	4½x4	8x7
3 x2½	5 x4½	8x6
3 x2	5 x4	8x5

LIST OF SIZES OF STANDARD CAST IRON SCREWED FITTINGS

Fig. 3848

BUSHINGS

Reducing one size only, are malleable up to 2½ inch, inclusive.

Size, Inches	Size, Inches	Size, Inches	Size, Inches
¼x ⅛	2 x ¾	4 x2	7x 3
⅜x ⅛	2 x1	4 x2½	7x 3½
⅜x ¼	2 x1¼	4 x3	7x 4
½x ¼	2 x1½	4 x3½	7x 4½
½x ⅜	2½x ½	4½x2	7x 5
¾x ¼	2½x ¾	4½x2½	7x 6
¾x ⅜	2½x1	4½x3	8x 2
¾x ½	2½x1¼	4½x3½	8x 2½
1 x ¼	2½x1½	4½x4	8x 3
1 x ⅜	2½x2	5 x1	8x 4
1 x ½	3 x ½	5 x2	8x 5
1 x ¾	3 x ¾	5 x2½	8x 6
1¼x ¼	3 x1	5 x3	8x 7
1¼x ⅜	3 x1¼	5 x3½	9x 6
1¼x ½	3 x1½	5 x4	9x 7
1¼x ¾	3 x2	5 x4½	9x 8
1¼x1	3 x2½	6 x1½	10x 4
1½x ¼	3½x1	6 x2	10x 5
1½x ⅜	3½x1¼	6 x2½	10x 6
1½x ½	3½x1½	6 x3	10x 7
1½x ¾	3½x2	6 x3½	10x 8
1½x1	3½x2½	6 x4	10x 9
1½x1¼	3½x3	6 x4½	12x 6
2 x ¼	4 x1	6 x5	12x 8
2 x ⅜	4 x1¼	7 x2	12x10
2 x ½	4 x1½	7 x2½	

Fig. 3849

FACED BUSHINGS

Size, Inches	Size, Inches	Size, Inches	Size, Inches
⅜x ¼	2 x ¾	3½x2	5x 4½
½x ⅜	2 x1	3½x2½	6x 3
¾x ⅜	2 x1¼	3½x3	*6x 4
¾x ½	2 x1½	*4 x2	*6x 5
1 x ½	2½x1¼	4 x2½	7x 5
1 x ¾	2½x1½	4 x3	7x 6
1¼x ¾	2½x2	4 x3½	8x 6
1¼x1	3 x1½	4½x4	8x 7
1½x ¾	3 x2	*5 x3	10x 8
1½x1	3 x2½	5 x4	12x10
1½x1¼			

LONG SWEEP FITTINGS

NO. 1 ELBOWS

Size, Inches	Size, Inches	Size, Inches	Size, Inches	Size, Inches
1	2½	4	6	9
1¼	3	4½	7	10
1½	3½	5	8	12
2				

NO. 2 DOUBLE BRANCH ELBOWS

Size, Inches	Size, Inches	Size, Inches
1 x1 x1	2 x2 x2½	4½x 4½x 4½
1¼x1¼x1¼	3 x3 x3	5 x 5 x 5
1 x1 x1¼	2 x2 x3	6 x 6 x 6
1½x1½x1½	2½x2½x3	7 x 7 x 7
1¼x1¼x1½	3½x3½x3½	8 x 8 x 8
2 x2 x2	4 x4 x4	9 x 9 x 9
1½x1½x2	3 x3 x4	10 x10 x10
2½x2½x2½	2½x2½x4	12 x12 x12

Fig. 3850

NO. 3 TEES, SINGLE SWEEP

Size, Inches	Size, Inches	Size, Inches
1 x1 x1	2½x2½x1½	4 x 4 x 3
1¼x1¼x1¼	2½x2½x1¼	4 x 4 x 2½
1¼x1¼x1	2½x2 x2	4 x 4 x 2
1¼x1 x1	2½x2 x1½	4 x 4 x 1½
1½x1½x1½	3 x3 x3	4 x 3 x 3
1½x1½x1¼	3 x3 x2½	4½x 4½x 4½
1½x1½x1	3 x3 x2	5 x 5 x 5
1½x1¼x1¼	3 x3 x1½	5 x 5 x 3
1½x1¼x1	3 x3 x1¼	5 x 5 x 2
2 x2 x2	3 x2½x2	6 x 6 x 6
2 x2 x1½	3½x3½x3½	6 x 6 x 2
2 x2 x1¼	3½x3½x2	7 x 7 x 7
2 x2 x1	3½x3½x1½	8 x 8 x 8
2 x1½x1½	3½x3½x1¼	9 x 9 x 9
2½x2½x2½	3½x3 x2	10 x10 x10
2½x2½x2	4 x4 x4	12 x12 x12

* NO. 5 TEES, STRAIGHT BACK

Size, Inches	Size, Inches	Size, Inches	Size, Inches
1 x1 x1	3½x3½x2½	3½x3 x4	3½x3 x5
1¼x1¼x1¼	3½x3 x3½	3½x2½x4	6 x6 x5
1½x1½x1½	3½x3 x3	3 x3 x4	6 x6 x4
2 x2 x2	3½x3 x2½	3 x2½x4	6 x6 x3½
2 x2 x1	3½x3 x2	4½x4½x4½	6 x6 x3
2 x1½x1½	3½x2½x3½	5 x5 x5	6 x5 x6
2 x1½x1	3½x2½x3	5 x5 x4	6 x5 x5
2½x2½x2½	3½x2½x2½	5 x5 x3½	6 x5 x4
2½x2½x2	3½x2 x3½	5 x5 x3	6 x5 x3½
2½x2½x1½	3½x2 x3	5 x5 x2½	6 x5 x3
2½x2½x1	3 x3 x3½	5 x4 x5	6 x4 x6
2½x2 x2½	3 x2½x3½	5 x4 x4	6 x4 x5
2½x2 x2	3 x2 x3½	5 x4 x3½	6 x4 x4
2½x2 x1½	2½x2½x3½	5 x4 x3	6 x3½x6
2 x2 x2½	4 x4 x4	5 x4 x2½	6 x3½x5
3 x3 x3	4 x4 x3½	5 x3½x5	6 x3 x6
3 x3 x2½	4 x4 x3	5 x3½x4	6 x5 x6
3 x3 x2	4 x4 x2½	5 x3½x3½	5 x4 x6
3 x3 x1½	4 x3½x4	5 x3 x5	5 x3½x6
3 x3 x1	4 x3½x3½	5 x3 x4½	5 x3 x6
3 x2½x3	4 x3½x3	5 x3 x4	4 x4 x6
3 x2½x2½	4 x3½x2½	5 x3 x3½	4 x3½x6
3 x2½x2	4 x3 x4	5 x2½x5	7 x7 x7
3 x2 x3	4 x3 x3½	5 x2½x4	8 x8 x8
3 x2 x2½	4 x3 x3	4 x4 x5	8 x8 x6
2½x2½x3	4 x3 x2½	4 x3½x5	8 x8 x4
2½x2 x3	4 x2½x4	4 x3 x5	9 x9 x9
3½x3½x3½	4 x2½x3½	4 x2½x5	10 x10 x10
3½x3½x3	3½x3½x4	3½x3½x5	12 x12 x12

NO. 4 CROSSES

Size, Inches	Size, Inches	Size, Inches
1 x1 x1 x1	3½x3½x3½x3½	7x 7x 7x 7
1¼x1¼x1¼x1¼	4 x4 x4 x4	8x 8x 8x 8
1½x1½x1½x1½	4 x4 x2½x2½	8 x 8x 6x 6
2 x2 x2 x2	5 x5 x5 x5	8x 8x 4x 4
2½x2½x2½x2½	5 x5 x4 x4	9x 9x 9x 9
2½x2½x1½x1½	5 x5 x3 x3	10x10x10x10
3 x3 x3 x3	6 x6 x6 x6	12x12x12x12
3 x3 x1½x1½	6 x6 x4 x4	

CAST IRON FITTINGS

STANDARD-FLANGED

FOR STEAM WORKING PRESSURES TO 125 LBS.

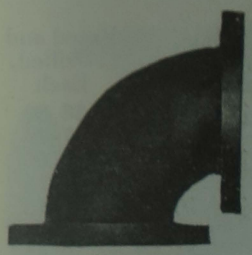


Fig. 3851
90° Elbow

Fig. 3852
45° Elbow

90° ELBOWS

Size, Inches	Center to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
1¼	3¾	4½	$3.00	$3.60
1½	4	5	3.00	3.60
2	4½	6	3.00	3.60
2½	5	7	3.15	3.75
3	5½	7½	3.45	4.15
3½	6	8½	4.05	4.90
4	6½	9	4.50	5.50
4½	7	9¼	5.50	6.50
5	7½	10	6.25	7.25
6	8	11	7.60	8.90
7	8½	12½	10.50	12.00
8	9	13½	12.00	13.60
9	10	15	17.00	19.25
10	11	16	19.00	21.70
12	12	19	28.00	31.00
14	14	21	41.50	45.25
15	14½	22¼	47.00	51.50
16	15	23½	54.50	59.50
18	16½	25	71.00	77.00
20	18	27½	90.00	97.00
22	20	29½	113.00	122.00
24	22	32	140.00	150.00

45° ELBOWS

Size, Inches	Center to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
1¼	2	4½	$3.30	$3.90
1½	2¼	5	3.30	3.90
2	2½	6	3.30	3.90
2½	3	7	3.50	4.10
3	3	7½	3.80	4.50
3½	3½	8½	4.50	5.35
4	4	9	5.00	6.00
4½	4	9¼	6.00	7.00
5	4½	10	6.90	7.90
6	5	11	8.35	9.65
7	5½	12½	11.00	12.50
8	5½	13½	12.60	14.20
9	6	15	17.75	20.00
10	6½	16	20.00	22.70
12	7½	19	29.50	32.50
14	7½	21	41.50	45.25
15	8	22¼	47.00	51.50
16	8	23½	54.50	59.50
18	8½	25	71.00	77.00
20	9½	27½	90.00	97.00
22	10	29½	113.00	122.00
24	11	32	140.00	150.00

Furnished faced only, unless otherwise ordered.
Larger sizes made to order.

CAST IRON FITTINGS

STANDARD—FLANGED

FOR STEAM WORKING PRESSURES TO 125 LBS.

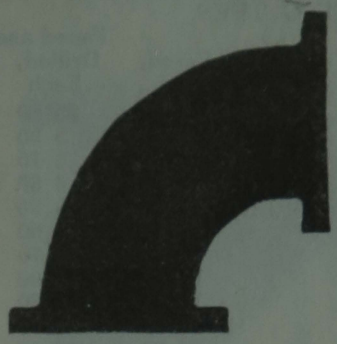


Fig. 3853
Long Radius Elbow

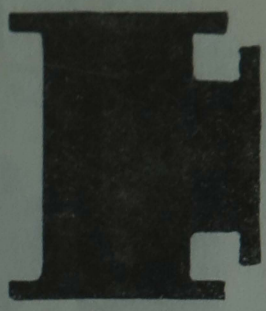


Fig. 3854
Tee

LONG RADIUS ELBOWS

Size, Inches	Center to Face, Inches	Radius, Inches	Diameter of Flanges, Inches	Faced Only, Each	Faced and Drilled, Each
2	6	5¼	6½	$5.00	$5.90
2½	7	5⅝	7	5.25	6.15
3	7½	6¼	7¾	5.75	6.85
3½	8½	6⅞	8½	6.75	8.00
4	9	7⅜	9	7.50	9.00
4½	9¼	7¾	9½	9.25	10.75
5	10	8½	10¼	10.50	12.00
6	11	9⅝	11½	12.65	14.60
7	12½	10⅞	12¾	17.50	19.75
8	13½	12	14	20.00	22.40
9	15	13	15¼	28.50	31.85
10	16	14⅛	16½	31.50	35.50
12	19	16½	19	46.50	51.00
14	21	18⅞	21½	69.00	74.50
15	22¼	20	22¾	78.00	84.75
16	23½	21¼	24	91.00	98.50
18	25	23⅝	26½	118.00	127.00
20	27½	26	29	150.00	160.00
22	29½	28⅜	31½	189.00	202.00
24	32	30¾	34	233.00	248.00

Reducing Taper Elbows; Prices on Application.

STRAIGHT TEES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
1¼	3¾	7½	4½	$4.35	$5.25
1½	4	8	5	4.35	5.25
2	4½	9	6	4.35	5.25
2½	5	10	7	4.55	5.45
3	5½	11	7½	5.00	6.10
3½	6	12	8½	5.85	7.10
4	6½	13	9	6.50	8.00
4½	7	14	9¼	8.00	9.50
5	7½	15	10	9.10	10.60
6	8	16	11	11.00	12.95
7	8½	17	12½	15.25	17.50
8	9	18	13½	17.40	19.80
9	10	20	15	24.65	28.00
10	11	22	16	27.50	31.50
12	12	24	19	40.50	45.00
14	14	28	21	60.00	65.50
15	14½	29	22¼	68.00	74.75
16	15	30	23½	79.00	86.50
18	16½	33	25	103.00	112.00
20	18	36	27½	130.00	140.00
22	20	40	29½	164.00	177.00
24	22	44	32	203.00	218.00

Furnished faced only, unless otherwise ordered.
Larger sizes made to order.

CAST IRON FITTINGS

STANDARD—FLANGED

FOR STEAM WORKING PRESSURE TO 125 LBS.

REDUCING TEES

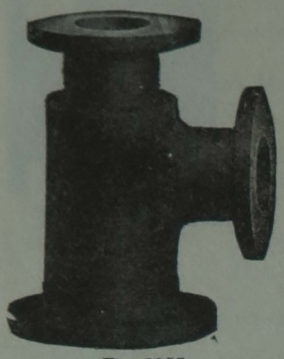


Fig. 3855

Size, Inches	Faced, Each	Faced and Drilled, Each
1½	$5.00	$5.90
2	5.00	5.90
2½	5.25	6.15
3	5.75	6.85
3½	6.75	8.00
4	7.50	9.00
4½	9.25	10.75
5	10.50	12.00
6	12.65	14.60
7	17.50	19.75
8	20.00	22.40
9	28.50	31.85
10	31.50	35.50
12	46.50	51.00
14	69.00	74.50
15	78.00	84.75
16	91.00	98.50
18	118.00	127.00
20	150.00	160.00
22	189.00	202.00
24	233.00	248.00

For dimensions, see Template for drilling. Larger sizes furnished to order.

The list price of reducing fittings is determined by the largest opening.

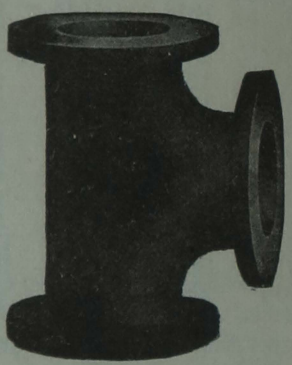


Fig. 3856

STRAIGHT, SINGLE AND DOUBLE SWEEP TEES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
2	4½	9	6	$5.00	$5.90
2½	5	10	7	5.25	6.15
3	5½	11	7½	5.75	6.85
3½	6	12	8½	6.75	8.00
4	6½	13	9	7.50	9.00
4½	7	14	9¼	9.25	10.75
5	7½	15	10	10.50	12.00
6	8	16	11	12.65	14.60
7	8½	17	12½	17.50	19.75
8	9	18	13½	20.00	22.40
9	10	20	15	28.50	31.85
10	11	22	16	31.50	35.50
12	12	24	19	46.50	51.00
14	14	28	21	69.00	74.50
15	14½	29	22¼	78.00	84.75
16	15	30	23½	91.00	98.50
18	16½	33	25	118.00	127.00
20	18	36	27½	150.00	160.00
22	20	40	29½	189.00	202.00
24	22	44	32	233.00	248.00

Furnished faced only, unless otherwise ordered. Larger sizes made to order.

CAST IRON FITTINGS

STANDARD—FLANGED

FOR STEAM WORKING PRESSURES TO 125 LBS.

REDUCING SINGLE AND DOUBLE SWEEP TEES.

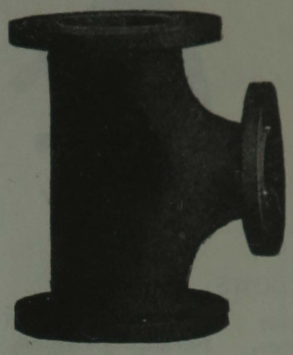


Fig. 3857

Size, Inches	Faced, Each	Faced and Drilled, Each
2½	$6.00	$6.90
3	6.60	7.70
3½	7.75	9.00
4	8.65	10.15
4½	10.60	12.10
5	12.00	13.50
6	14.50	16.45
7	20.00	22.25
8	23.00	25.40
9	32.75	36.10
10	36.00	40.00
12	53.50	58.00
14	79.00	84.50
15	90.00	96.75
16	105.00	112.50
18	135.00	144.00
20	173.00	183.00
22	217.00	230.00
24	268.00	283.00

For dimensions, see Template for drilling. Larger sizes furnished to order.

Double sweep tees are not made reducing on the run. Single sweep tees are not made with side openings larger than the run.

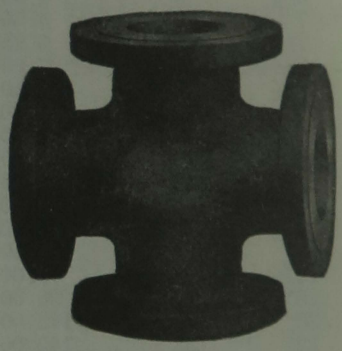


Fig. 3858

STRAIGHT CROSSES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	Faced Only, Each	Faced and Drilled, Each
1¼	3¾	7½	4½	$6.75	$7.95
1½	4	8	5	6.75	7.95
2	4½	9	6	6.75	7.95
2½	5	10	7	6.95	8.15
3	5½	11	7½	7.65	9.05
3½	6	12	8½	9.00	10.70
4	6½	13	9	10.00	12.00
4½	7	14	9¼	12.00	14.00
5	7½	15	10	13.75	15.75
6	8	16	11	16.75	19.25
7	8½	17	12½	23.00	26.00
8	9	18	13½	26.50	29.75
9	10	20	15	37.50	42.00
10	11	22	16	42.00	47.50
12	12	24	19	61.50	67.50
14	14	28	21	91.00	98.50
15	14½	29	22¼	103.00	112.00
16	15	30	23½	120.00	130.00
18	16½	33	25	157.00	169.00
20	18	36	27½	198.00	212.00
22	20	40	29½	248.00	266.00
24	22	44	32	310.00	330.00

Furnished faced only, unless otherwise ordered. Larger sizes made to order.

CAST IRON FITTINGS

STANDARD—FLANGED

FOR STEAM WORKING PRESSURE TO 125 LBS.

REDUCING CROSSES

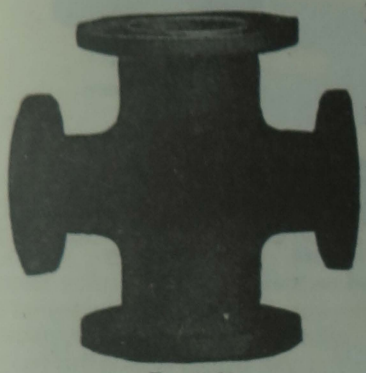


Fig. 3859

Size, Inches	Faced Only, Each	Faced and Drilled, Each
2	$7.75	$8.95
2½	8.00	9.20
3	8.75	10.15
3½	10.35	12.05
4	11.50	13.50
4½	13.75	15.75
5	15.75	17.75
6	19.25	21.75
7	26.50	29.50
8	30.50	33.75
9	43.00	47.50
10	48.00	53.50
12	71.00	77.00
14	105.00	112.50
15	118.00	127.00
16	138.00	148.00
18	180.00	192.00
20	228.00	242.00
22	285.00	303.00
24	355.00	375.00

For dimensions, see Template for drilling. Larger sizes made to order.

The list price of reducing fittings is determined by the largest opening.

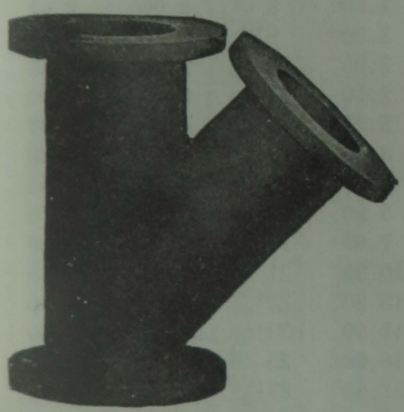


Fig. 3860

STRAIGHT LATERALS

Furnished faced only, unless otherwise ordered. Larger sizes made to order only.

Prices on Application.

Size, Inches	Center to Face of Outlet, Inches	Face to Face of Run, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
2	8	10½	6	$6.75	$7.95
2½	9½	12	7	6.95	8.15
3	10	13	7½	7.65	9.05
3½	11½	14½	8½	9.00	10.70
4	12	15	9	10.00	12.00
4½	12½	15½	9¼	12.00	14.00
5	13½	17	10	13.75	15.75
6	14½	18	11	16.75	19.25
7	16½	20½	12½	23.00	26.00
8	17½	22	13½	26.50	29.75
9	19½	24	15	37.50	42.00
10	20½	25½	16	42.00	47.50
12	24½	30	19	61.50	67.50
14	27	33	21	91.00	98.50
15	28½	34½	22¼	103.00	112.00
16	30	36½	23½	120.00	130.00
18	32	39	25	157.00	169.00

List price of reducing fittings is determined by the largest opening.

CAST IRON FITTINGS

STANDARD-FLANGED

FOR STEAM WORKING PRESSURES TO 125 LBS.

REDUCING LATERALS

Fig. 3861

Size, Inches	Faced, Each	Faced and Drilled, Each
2	$7.75	$8.95
2½	8.00	9.20
3	8.75	10.15
3½	10.35	12.05
4	11.50	13.50
4½	13.75	15.75
5	15.75	17.75
6	19.25	21.75
7	26.50	29.50
8	30.50	33.75
9	43.00	47.50
10	48.00	53.50
12	71.00	77.00
14	105.00	112.50
15	118.00	127.00
16	138.00	148.00
18	180.00	192.00

For dimensions see Templates for drilling. Larger sizes furnished to order. List price of reducing fittings is determined by the largest opening.

Fig. 3862

BASE ELBOWS—ROUND OR SQUARE BASE

Furnished faced and drilled only, unless otherwise ordered. Larger sizes made to order only.

Prices on Application.

Size, Inches	Center to Face of Base, Inches	*Diameter of Base Flange, Inches	Faced Except Base Flange, Each	Faced and Drilled Except Base Flange, Each	Facing and Drilling Base Flange, Each
4	6½	6	$9.00	$10.00	$3.00
4½	6¾	6	11.00	12.00	3.00
5	7	7	12.50	13.50	3.50
6	7½	7	15.25	16.55	3.50
7	8¼	7	21.00	22.50	3.50
8	8¾	9	24.00	25.60	5.00
9	9½	9	34.00	36.25	5.00
10	10	9	38.00	40.70	5.00
12	10½	11	56.00	59.00	7.50
14	13½	11	70.00	73.75	7.50
15	14	11	80.00	84.50	7.50
16	14¾	11	90.00	95.00	7.50
18	15½	13½	105.00	111.00	12.00

*For diameter of regular flanges, see templates for drilling. The dimensions across the flat edges of square base flange are the same as the diameter of round base flange.

BASE TEES

Base tees made to order. Sizes, dimensions and prices on application.

CAST IRON FITTINGS

STANDARD—FLANGED

FOR STEAM WORKING PRESSURES TO 125 LBS.

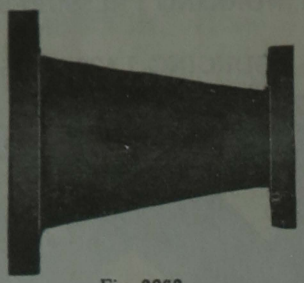


Fig. 3863

TAPER REDUCERS

Size, Inches	Face to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
3 x2	6	7½x 6	$6.90	$7.60
3½x 2½	6½	8½x 7	8.10	8.95
4 x 2	7	9 x 6	9.00	10.00
4 x 2½	7	9 x 7	9.00	10.00
4 x 3	7	9 x 7½	9.00	10.00
5 x 2	8	10 x 6	12.50	13.50
5 x 2½	8	10 x 7	12.50	13.50
5 x 3	8	10 x 7½	12.50	13.50
5 x 4	8	10 x 9	12.50	13.50
6 x 3	9	11 x 7½	15.25	16.55
6 x 3½	9	11 x 8½	15.25	16.55
7 x 4	9	11 x 9	15.25	16.55
6 x 5	9	11 x10	15.25	16.55
7 x 3	10	12½x 7½	21.00	22.50
7 x 4	10	12½x 9	21.00	22.50
7 x 5	10	12½x10	21.00	22.50
7 x 6	10	12½x11	21.00	22.50
8 x 3	11	13½x 7½	24.00	25.60
8 x 4	11	13½x 9	24.00	25.60
8 x 5	11	13½x10	24.00	25.60
8 x 6	11	13½x11	24.00	25.60
10 x 4	12	16 x 9	38.00	40.70
10 x 5	12	16 x10	38.00	40.70
10 x 6	12	16 x11	38.00	40.70
10 x 8	12	16 x13½	38.00	40.70
12 x 5	14	19 x10	56.00	59.00
12 x 6	14	19 x11	56.00	59.00
12 x 8	14	19 x13½	56.00	59.00
12 x10	14	19 x16	56.00	59.00
14 x 6	16	21 x11	70.00	73.75
14 x 8	16	21 x13½	70.00	73.75
14 x10	16	21 x16	70.00	73.75
14 x12	16	21 x19	70.00	73.75
15 x 8	17	22¼x13½	80.00	84.50
15 x10	17	22¼x16	80.00	84.50
15 x12	17	22¼x19	80.00	84.50
15 x14	17	22¼x21	80.00	84.50
16 x 8	18	23½x13½	90.00	95.00
16 x10	18	23½x16	90.00	95.00
16 x12	18	23½x19	90.00	95.00
16 x14	18	23½x21	90.00	95.00

Furnished faced only, unless otherwise ordered. Eccentric taper reducers will be made to order. Prices on Application.

CAST IRON COMPANION FLANGES

STANDARD

FOR STEAM WORKING PRESSURES TO 125 LBS.

Fig. 3864
Back View, Showing Hub

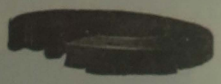


Fig. 3865
Smooth Face

Fig. 3866
Blind or Solid

Pipe size and D.D. Flange, Inches	THREADED Faced, Each	THREADED Faced and Drilled, Each	BLIND OR SOLID Outside Size, Inches	BLIND OR SOLID Faced, Each	BLIND OR SOLID Faced and Drilled, Each
1 x 4	$0.55	$0.80	4	$.....	$.....
1¼x 4½	.60	.85	4½	.....	.....
1½x 5	.65	.90	5	.....	.....
2 x 6	.75	1.00	6	$1.15	$1.40
2½x 7	.85	1.10	7	1.30	1.55
3 x 7½	.95	1.25	7½	1.40	1.70
3½x 8½	1.20	1.55	8½	1.80	2.15
4 x 9	1.35	1.80	9	2.00	2.45
4½x 9¼	1.45	1.90	9¼	2.20	2.65
5 x10	1.60	2.05	10	2.40	2.85
6 x11	2.00	2.50	11	3.00	3.50
7 x12½	2.65	3.25	12½	4.00	4.60
8 x13½	3.10	3.80	13½	4.60	5.30
9 x15	3.85	4.65	15	5.75	6.55
10 x16	4.50	5.50	16	6 75	7.75
12 x19	6.50	7.65	19	9.75	10.90
14 x21	9.00	10.35	21	13.50	14.85
15 x22¼	11.50	13.20	22¼	17.00	18.70
16 x23½	13.50	15.30	23½	20.00	21.80
18 x25	16.00	18.00	25	24.00	26.00
20 x27½	19.00	21.50	27½	28.00	30.50
22 x29½	22.00	25.00	29½	33.00	36.00
24 x32	27.00	30.50	32	40.00	43.50

Flanges furnished plain faced, unless otherwise specified. Size 14 inches and larger to be used with O.D. pipe of the same size.

NET PRICES FOR ATTACHING FLANGES TO FITTINGS

Size of Fittings, Inches	Bolting Flanges to Fittings, not Including Bolts or Gaskets, Per Flange	Size of Fitting, Inches	Wooden Protection Bolted on with Two Bolts, Per Flange
1¼ to 4	$0.10	1¼ to 2½	$0.20
4½ to 8	.15	3 to 6	.25
9 to 14	.20	7 to 9	.30
15 to 24	.25	10 to 12	.35
18 to 26	.30	14 to 15	.40
28 to 30	.35	16 to 18	.45
		20 to 24	.50

Spot facing bolt holes, five cents net extra per hole. Prices apply to both straight and reducing flanged fittings. No gaskets furnished unless ordered.

REDUCING COMPANION FLANGES

CAST IRON—STANDARD

FOR STEAM WORKING PRESSURES TO 125 LBS.

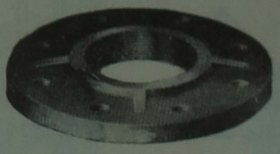


Fig. 3867

These flanges, used in connection with straight or reducing fittings, enable us to fill orders for reduced sizes very promptly. Customers who desire fittings reduced in this manner will please specify, Reduce by flanges if necessary.

Flanges will always be the same thickness as the regular companion flanges of corresponding outside diameter.

They are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

In ordering reducing companion flanges, always give the screwed or reduced size first, then the outside diameter of flange wanted.

Size, Inches	Faced, Each	Faced and Drilled, Each	Size, Inches	Faced, Each	Faced and Drilled, Each
1 x 6	$1.30	$1.55	7 x15	$6.35	$7.15
1¼x 6	1.30	1.55	8 x15	6.35	7.15
1½x 6	1.30	1.55	2½x16	7.45	8.45
1½x 7	1.45	1.70	3 x16	7.45	8.45
2 x 7	1.45	1.70	3½x16	7.45	8.45
1½x 7½	1.55	1.85	4 x16	7.45	8.45
2 x 7½	1.55	1.85	5 x16	7.45	8.45
2½x 7½	1.55	1.85	6 x16	7.45	8.45
2 x 8½	2.00	2.35	7 x16	7.45	8.45
2½x 8½	2.00	2.35	8 x16	7.45	8.45
3 x 8½	2.00	2.35	9 x16	7.45	8.45
2 x 9	2.20	2.65	6 x19	10.75	11.90
2½x 9	2.20	2.65	7 x19	10.75	11.90
3 x 9	2.20	2.65	8 x19	10.75	11.90
3½x 9	2.20	2.65	9 x19	10.75	11.90
2½x 9¼	2.40	2.85	10 x19	10.75	11.90
3 x 9¼	2.40	2.85	8 x21	15.00	16.35
3½x 9¼	2.40	2.85	9 x21	15.00	16.35
4 x 9¼	2.40	2.85	10 x21	15.00	16.35
2 x10	2.65	3.10	12 x21	15.00	16.35
2½x10	2.65	3.10	8 x22¼	19.00	20.70
3 x10	2.65	3.10	10 x22¼	19.00	20.70
3½x10	2.65	3.10	12 x22¼	19.00	20.70
4 x10	2.65	3.10	14 x22¼	19.00	20.70
4½x10	2.65	3.10	10 x23½	22.00	23.80
2 x11	3.30	3.80	12 x23½	22.00	23.80
2½x11	3.30	3.80	14 x23½	22.00	23.80
3 x11	3.30	3.80	15 x23½	22.00	23.80
3½x11	3.30	3.80	12 x25	26.50	28.50
4 x11	3.30	3.80	14 x25	26.50	28.50
4½x11	3.30	3.80	15 x25	26.50	28.50
5 x11	3.30	3.80	16 x25	26.50	28.50
4 x12½	4.40	5.00	14 x27½	31.00	33.50
4½x12½	4.40	5.00	15 x27½	31.00	33.50
5 x12½	4.40	5.00	16 x27½	31.00	33.50
6 x12½	4.40	5.00	18 x27½	31.00	33.50
2 x13½	5.10	5.80	15 x29½	36.00	39.00
2½x13½	5.10	5.80	16 x29½	36.00	39.00
3 x13½	5.10	5.80	18 x29½	36.00	39.00
4 x13½	5.10	5.80	20 x29½	36.00	39.00
5 x13½	5.10	5.80	14 x32	44.00	47.50
6 x13½	5.10	5.80	16 x32	44.00	47.50
7 x13½	5.10	5.80	18 x32	44.00	47.50
6 x15	6.35	7.15	20 x32	44.00	47.50

Furnished faced only, unless otherwise ordered.

Sizes 14 inches and larger are to be used with O.D. pipe of the same sizes.

DIMENSIONS AND TEMPLATES FOR DRILLING STANDARD CAST IRON COMPANION FLANGES

FOR STEAM WORKING PRESSURES TO 125 LBS

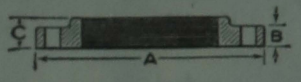


Fig. 3868

American Standard in Effect Jan. 1, 1916

GENERAL DIMENSIONS

Size, Inches	Diameter of Flanges, Inches	Thickness of Flanges, Inches	Bolt Circle, Inches
¾	3½	1/16	2½
1	4	7/16	3
1¼	4½	1/2	3⅜
1½	5	9/16	3⅞
2	6	5/8	4¾
2½	7	11/16	5½
3	7½	3/4	6
3½	8½	13/16	7
4	9	15/16	7½
4½	9¼	15/16	7¾
5	10	15/16	8½
6	11	1	9½
7	12½	1 1/16	10¾
8	13½	1 1/8	11¾
9	15	1 1/8	13¼
10	16	1 3/16	14¼
12	19	1¼	17
14	21	1 3/8	18¾
15	22¼	1 3/8	20
16	23½	1 7/16	21¼
18	25	1 9/16	22¾
20	27½	1 11/16	25
22	29½	1 13/16	27¼
24	32	1⅞	29½

BOLT SIZES

Size, Inches	Number of Bolts	Size of Bolts, Inches	Length of Bolts, Inches
¾	4	3/8	1½
1	4	7/16	1½
1¼	4	7/16	1½
1½	4	1/2	1¾
2	4	5/8	2
2½	4	5/8	2¼
3	4	5/8	2½
3½	4	5/8	2½
4	8	5/8	2¾
4½	8	3/4	3
5	8	3/4	3
6	8	3/4	3
7	8	3/4	3
8	8	3/4	3¼
9	12	3/4	3¼
10	12	7/8	3½
12	12	7/8	3¾
14	12	1	4
15	16	1	4¼
16	16	1	4¼
18	16	1⅛	4¾
20	20	1⅛	5
22	20	1¼	5½
24	20	1¼	5½

GENERAL DIMENSIONS OF STANDARD CAST IRON FLANGED FITTINGS

FOR STEAM WORKING PRESSURE TO 125 LBS.

STRAIGHT SIZES

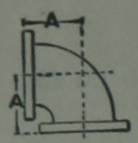


Fig. 3869

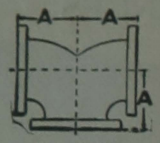


Fig. 3870

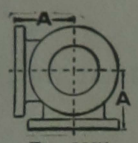


Fig. 3871

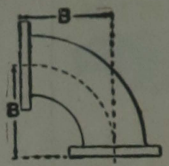


Fig. 3872

Fig. 3873

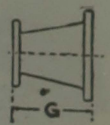


Fig. 3874

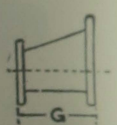


Fig. 3875

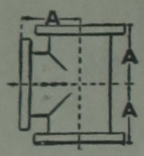


Fig 3876

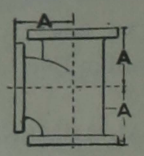


Fig. 3877

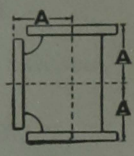


Fig. 3878

Fig. 3879

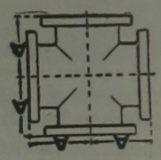


Fig. 3880

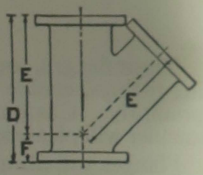


Fig. 3881

Flanged fittings are drilled in multiples of four, so that they may be made to face in any quarter and bolt holes all straddle center line.

Referring to following tables: dimensions are regulated by the size of outlet.

Fittings reducing on the run only, the long body pattern will always be used, except double sweep tees, on which the reduced end (dimension on request) is always longer than the regular fittings.

Bullheads or tees having outlet larger than the run, will be the same length center to face of all openings as a tee with all openings of the size of the outlet. For example, a 12x12x16-inch tee will be governed by the dimensions of the 16-inch long body tee, namely, 15 inches center to face of all openings and 30 inches face to face.

LONG BODY PATTERN

Size, Inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7
AA-Face to Face, Tees and Crosses, Inches	7½	8	9	10	11	12	13	14	15	16	17
A-C to F., Elbows, Tees and Crosses, Inches	3¾	4	4½	5	5½	6	6½	7	7½	8	8½
B-C to F., Long Radius Elbows, Inches	5½	6	6½	7	7¾	8½	9	9½	10¼	11½	12¾
C-Center to Face, 45 Degrees Elbows, Inches	2	2¼	2½	3	3	3½	4	4	4½	5	5½
D-Face to Face, Laterals, Inches	8	9	10½	12	13	14½	15	15½	17	18	20½
E-Center to Face, Laterals, Inches	6¼	7	8	9½	10	11½	12	12½	13½	14½	16½
F-Center to Face, Laterals, Inches	1¾	2	2½	2½	3	3	3	3	3½	3½	4
G-Face to Face, Reducers, Inches	.....	.....	.....	.....	6	6½	7	7½	8	9	10
Diameter of Flanges, Inches	4½	5	6	7	7½	8½	9	9¼	10	11	12½
Thickness of Flanges, Inches	½	9/16	5/8	11/16	¾	13/16	15/16	15/16	15/16	1	1 1/16

Size, Inches	8	9	10	12	14	15	16	18	20	22	24
AA-Face to Face, Tees and Crosses, Inches	18	20	22	24	28	29	30	33	36	40	44
A-C to F., Elbows, Tees and Crosses, Inches	9	10	11	12	14	14½	15	16½	18	20	22
B-C to F., Long Radius Elbows, Inches	14	15¼	16½	19	21½	22¾	24	26½	29	31½	34
C-Center to Face, 45 Degrees Elbows, Inches	5½	6	6½	7½	7½	8	8	8½	9½	10	11
D-Face to Face, Laterals, Inches	22	24	25½	30	33	34½	36½	39	43	46	49½
E-Center to Face, Laterals, Inches	17½	19½	20½	24½	27	28½	30	32	35	37½	40½
F-Center to Face, Laterals, Inches	4½	4½	5	5½	6	6	6½	7	8	8½	9
G-Face to Face, Reducers, Inches	11	11½	12	14	16	17	18	19	20	22	24
Diameter of Flanges, Inches	13½	15	16	19	21	22¼	23½	25	27½	29½	32
Thickness of Flanges, Inches	1⅛	1⅛	1 3/16	1¼	1⅜	1⅜	1 7/16	1 9/16	1 11/16	1 13/16	1⅞

REDUCING SIZES 18 INCHES AND LARGER

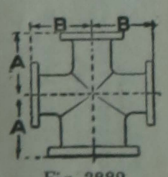


Fig. 3882

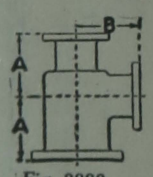


Fig. 3883

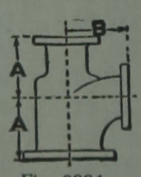


Fig. 3884

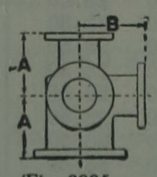


Fig. 3885

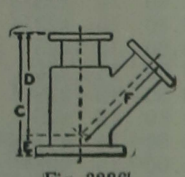


Fig. 3886

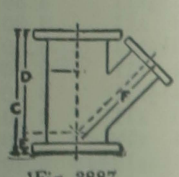


Fig. 3887

SHORT BODY PATTERN

REDUCING TEES AND CROSSES

Size, Inches	18	20	22	24
Size of Outlets and Smaller, Inches	12	14	15	16
AA-Face to Face of Run, Inches	26	28	28	30
A-Center to Face of Run, Inches	13	14	14	15
B-Center to Face of Outlets, Inches	15½	17	18	19

REDUCING LATERALS

Size, Inches	18	20	22	24
Size of Branch and Smaller, Inches	9	10	10	12
C-Face to Face, Run, Inches	26	28	29	32
D-Center to Face, Run, Inches	25	27	28½	31½
E-Center to Face, Run, Inches	1	1	1½	1½
F-Center to Face, Branch, Inches	27½	29½	31½	34½

All reducing fittings 1¼ to 16 inch, inclusive, have same center to face dimensions as straight size fittings.

Long Body Patterns are used when branches are larger than given in the above table, therefore have same dimensions as straight size fittings.

The dimensions of Reducing Flanged Fittings are always regulated by the reduction of the branch; fittings reducing on the run only, the long body pattern will always be used.

CAST IRON FITTINGS

EXTRA HEAVY—FLANGED

FOR STEAM WORKING PRESSURE TO 250 LBS.

Fig. 3888
90° Elbow

Fig. 3889
45° Elbow

90° ELBOWS

Size, Inches	Center to Face, Inches	Diameter of Flange, Inches	Faced Only, Each	Faced and Drilled, Each
1¼	4¼	5	$4.50	$5.40
1½	4½	6	4.50	5.40
2	5	6½	4.50	5.40
2½	5½	7½	4.75	5.65
3	6	8¼	5.15	6.25
3½	6½	9	6.10	7.35
4	7	10	6.75	8.25
4½	7½	10½	8.25	9.75
5	8	11	9.35	10.85
6	8½	12½	11.40	13.40
7	9	14	15.75	18.00
8	10	15	18.00	20.50
9	10½	16¼	25.50	28.85
10	11½	17½	28.50	32.50
12	13	20½	42.00	46.50
14	15	23	62.00	67.50
15	15½	24½	70.00	77.00
16	16½	25½	82.00	90.00
18	18	28	106.00	115.00
20	19½	30½	135.00	145.00
22	20½	33	170.00	183.00
24	22½	36	210.00	225.00

45° ELBOWS

Size, Inches	Center to Face, Inches	Diameter of Flange, Inches	Faced Only, Each	Faced and Drilled, Each
1¼	2½	5	$5.00	$5.90
1½	2¾	6	5.00	5.90
2	3	6½	5.00	5.90
2½	3½	7½	5.25	6.15
3	3½	8¼	5.65	6.75
3½	4	9	6.75	8.00
4	4½	10	7.50	9.00
4½	4½	10½	9.00	10.50
5	5	11	10.35	11.85
6	5½	12½	12.50	14.50
7	6	14	16.50	18.75
8	6	15	19.00	21.50
9	6½	16¼	26.75	30.10
10	7	17½	30.00	34.00
12	8	20½	44.00	48.50
14	8½	23	62.00	67.50
15	9	24½	70.00	77.00
16	9½	25½	82.00	90.00
18	10	28	106.00	115.00
20	10½	30½	135.00	145.00
22	11	33	170.00	183.00
24	12	36	210.00	225.00

Furnished faced only, unless otherwise ordered.
Larger sizes made to order.

CAST IRON FITTINGS

EXTRA HEAVY—FLANGED

FOR STEAM WORKING PRESSURE TO 250 LBS.

Fig. 3890
Long Radius Elbow

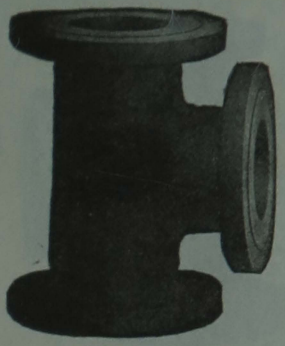


Fig. 3891
Straight Tee

LONG RADIUS ELBOWS

Size, Inches	Center to Face, Inches	Radius, Inches	Diameter of Flanges, Inches	Faced Only, Each	Faced and Drilled, Each
2	6½	5¼	6½	$7.50	$8.85
2½	7	5⅝	7½	8.00	9.35
3	7¾	6¼	8¼	8.60	10.25
3½	8½	6⅞	9	10.25	12.15
4	9	7⅜	10	11.25	13.50
4½	9½	7¾	10½	13.75	16.00
5	10¼	8½	11	15.50	17.75
6	11½	9⅝	12½	19.00	22.00
7	12¾	10⅞	14	26.50	29.85
8	14	12	15	30.00	33.75
9	15¼	13	16¼	42.50	47.50
10	16½	14⅛	17½	47.75	53.75
12	19	16½	20½	70.00	76.75
14	21½	18⅞	23	103.50	111.75
15	22¾	20	24½	117.00	127.00
16	24	21¼	25½	137.00	149.00
18	26½	23⅝	28	177.00	191.00
20	29	26	30½	225.00	240.00
22	31½	28⅜	33	285.00	305.00
24	34	30¾	36	350.00	373.00

Reducing Taper Elbows. Prices on Application.

STRAIGHT TEES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diameter of Flanges, Inches	Faced, Each	Faced and Drilled, Each
1¼	4¼	8½	5	$6.50	$7.85
1½	4½	9	6	6.50	7.85
2	5	10	6½	6.50	7.85
2½	5½	11	7½	6.90	8.25
3	6	12	8¼	7.50	9.15
3½	6½	13	9	8.90	10.80
4	7	14	10	9.75	12.00
4½	7½	15	10½	12.00	14.25
5	8	16	11	13.50	15.75
6	8½	17	12½	16.50	19.50
7	9	18	14	23.00	26.35
8	10	20	15	26.00	29.75
9	10½	21	16¼	37.00	42.00
10	11½	23	17½	41.50	47.50
12	13	26	20½	61.00	67.75
14	15	30	23	90.00	98.25
15	15½	31	24½	102.00	112.00
16	16½	33	25¼	119.00	131.00
18	18	36	28	154.00	168.00
20	19½	39	30½	195.00	210.00
22	20½	41	33	247.00	267.00
24	22½	45	36	305.00	328.00

Furnished face only, unless otherwise ordered.
Larger sizes made to order.

CAST IRON FITTINGS

EXTRA HEAVY-FLANGED

For Working Steam Pressure to 250 Lbs.

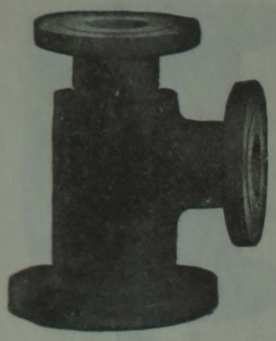


Fig. 3892

REDUCING TEES

Size, Inches	Faced, Each	Faced and Drilled, Each
1½	$7.50	$8.85
2	7.50	8.85
2½	8.00	9.35
3	8.60	10.25
3½	10.25	12.15
4	11.25	13.50
4½	13.75	16.00
6	15.50	17.75
5	19.00	22.00
7	26.50	29.85
8	30.00	33.75
9	42.50	47.50
10	47.75	53.75
12	70.00	76.75
14	103.50	111.75
15	117.00	127.00
16	137.00	149.00
18	177.00	191.00
20	225.00	240.00
22	285.00	305.00
24	350.00	373.00

For dimensions see template for drilling. Larger sizes furnished to order. List price of reducing fittings is determined by the largest opening.

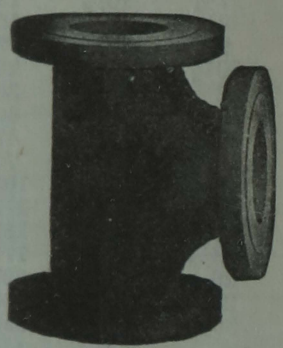


Fig. 3893

STRAIGHT, SINGLE AND DOUBLE SWEEP TEES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diam. of Flange, Inches	Faced, Each	Faced and Drilled, Each
2	5	10	6½	$7.50	$8.85
2½	5½	11	7½	8.00	9.35
3	6	12	8¼	8.60	10.25
3½	6½	13	9	10.25	12.15
4	7	14	10	11.25	13.50
4½	7½	15	10½	13.75	16.00
5	8	16	11	15.50	17.75
6	8½	17	12½	19.00	22.00
7	9	18	14	26.50	29.85
8	10	20	15	30.00	33.75
9	10½	21	16¼	42.50	47.50
10	11½	23	17½	47.75	53.75
12	13	26	20½	70.00	76.75
14	15	30	23	103.50	111.75
15	15½	31	24½	117.00	127.00
16	16½	33	25½	137.00	149.00
18	18	36	28	177.00	191.00
20	19½	39	30½	225.00	240.00
22	20½	41	33	285.00	305.00
24	22½	45	36	350.00	373.00

Furnished faced only unless otherwise ordered. Larger sizes made to order.

CAST IRON FITTINGS

EXTRA HEAVY-FLANGED

For Working Steam Pressure to 250 Lbs.

Fig. 3894

REDUCING SINGLE AND DOUBLE SWEEP TEES

Size, Inches	Faced, Each	Faced and Drilled, Each
2½	$9.15	$10.50
3	9.90	11.55
3½	11.75	13.65
4	13.00	15.25
4½	15.75	18.00
5	17.85	20.10
6	22.00	25.00
7	30.50	33.85
8	34.50	38.25
9	49.00	54.00
10	55.00	61.00
12	80.00	86.75
14	119.00	127.25
15	135.00	145.00
16	158.00	170.00
18	204.00	218.00
20	260.00	275.00
22	327.00	347.00
24	402.00	425.00

Single sweep Tees are not made with side openings larger than the run.

Double sweep Tees are not made reducing on the run. For dimensions see Templates for drilling.

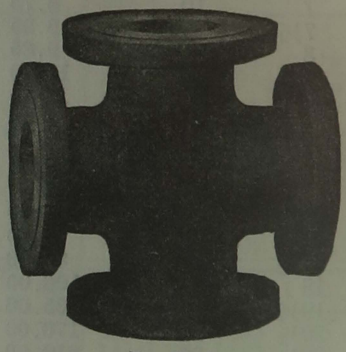


Fig. 3895

STRAIGHT CROSSES

Size, Inches	Center to Face, Inches	Face to Face, Inches	Diam. of Flanges, Inches	Faced Only, Each	Faced and Drilled, Each
1¼	4¼	8½	5	$10.00	$11.80
1½	4½	9	6	10.00	11.80
2	5	10	6½	10.00	11.80
2½	5½	11	7½	10.50	12.30
3	6	12	8¼	11.50	13.75
3½	6½	13	9	13.50	16.00
4	7	14	10	15.00	18.00
4½	7½	15	10½	18.00	21.00
5	8	16	11	20.50	23.50
6	8½	17	12½	25.00	29.00
7	9	18	14	35.00	39.50
8	10	20	15	40.00	45.00
9	10½	21	16¼	56.00	62.75
10	11½	23	17½	63.00	71.00
12	13	26	20½	92.00	101.00
14	15	30	23	136.00	147.00
15	15½	31	24½	155.00	169.00
16	16½	33	25½	180.00	196.00
18	18	36	28	235.00	253.00
20	19½	39	30½	300.00	320.00
22	20½	41	33	375.00	401.00
24	22½	45	36	465.00	495.00

Furnished faced only unless otherwise ordered. Larger sizes made to order.

CAST IRON FITTINGS

EXTRA HEAVY-FLANGED

FOR STEAM WORKING PRESSURES TO 250 LBS.

REDUCING CROSSES

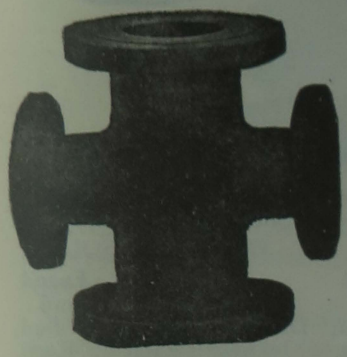


Fig. 3896

For dimensions see Templates for Drilling. Larger sizes furnished to order. List price of reducing fittings is determined by the largest opening.

Size, Inches	Faced, Each	Faced and Drilled, Each
2	$11.50	$13.30
2½	12.00	13.80
3	13.25	15.50
3½	15.50	18.00
4	17.00	20.00
4½	21.00	24.00
5	23.50	26.50
6	29.00	33.00
7	40.00	44.50
8	46.00	51.00
9	65.00	71.75
10	72.00	80.00
12	106.00	115.00
14	158.00	169.00
15	177.00	191.00
16	207.00	223.00
18	270.00	288.00
20	345.00	365.00
22	430.00	456.00
24	535.00	565.00

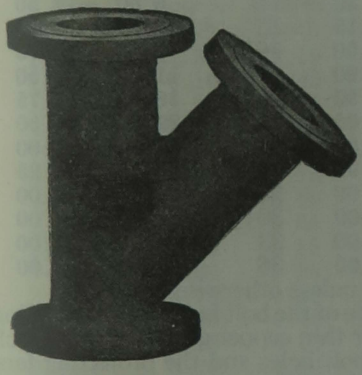


Fig. 3897

Furnished faced only unless otherwise ordered.

Larger sizes made to order. Prices on Application.

STRAIGHT FLANGED LATERALS

Size, Inches	Center to Face of Outlet, Inches	Face to Face of Run, Inches	Diam. of Flanges, Inches	Faced Only, Each	Faced and Drilled, Each
2	9	11½	6½	$10.00	$11.80
2½	10½	13	7½	10.50	12.30
3	11	14	8¼	11.50	13.75
3½	12½	15½	9	13.50	16.00
4	13½	16½	10	15.00	18.00
4½	14½	18	10½	18.00	21.00
5	15	18½	11	20.50	23.50
6	17½	21½	12½	25.00	29.00
7	19	23½	14	35.00	39.50
8	20½	25½	15	40.00	45.00
9	22½	27½	16¼	56.00	62.75
10	24	29½	17½	63.00	71.00
12	27½	33½	20½	92.00	101.00
14	31	37½	23	136.00	147.00
15	33	39½	24½	155.00	169.00
16	34½	42	25½	180.00	196.00
18	37½	45½	28	235.00	253.00
20	40½	49	30½	300.00	320.00
22	43½	53	33	375.00	401.00
24	47½	57½	36	465.00	495.00

CAST IRON FITTINGS

EXTRA HEAVY-FLANGED

FOR STEAM WORKING PRESSURES TO 250 LBS.

REDUCING FLANGED LATERALS

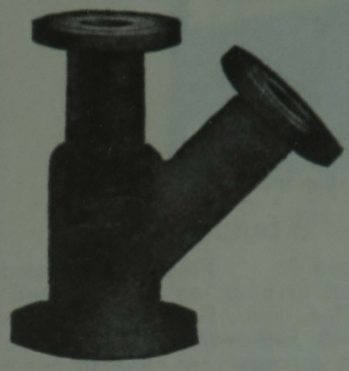


Fig. 3898

List price of reducing fittings is determined by the largest opening. For dimensions see Templates for Drilling.

Size, Inches	Faced, Each	Faced and Drilled, Each
2½	$12.00	$13.80
2	13.25	15.50
3½	15.50	18.00
4	17.00	20.00
4½	21.00	24.00
5	23.50	26.50
6	29.00	33.00
7	40.00	44.50
8	46.00	51.00
9	65.00	71.75
10	72.00	80.00
12	106.00	115.00
14	158.00	169.00
15	177.00	191.00
16	207.00	223.00
18	270.00	288.00
20	345.00	365.00
22	430.00	456.00
24	535.00	565.00

Fig. 3899

Furnished faced only, unless otherwise ordered.

Larger sizes made to order. Prices on Application.

BASE ELBOWS—ROUND OR SQUARE BASE

Size, Inches	Center to Face of Base, Inches	*Diam. of Base Flange, Inches	Faced Except Base Flange, Each	Faced and Drilled Except Base Flange, Each	Facing and Drilling Base Flange, Each
4	7	6½	$13.50	$15.00	$4.50
4½	7¼	6½	16.50	18.00	4.50
5	7½	7½	18.75	20.25	5.25
6	8	7½	22.75	24.75	5.25
7	8¾	7½	31.50	33.75	5.25
8	9¼	10	36.00	38.50	7.50
9	10	10	51.00	54.35	7.50
10	10½	10	57.00	61.00	7.50
12	11	12½	84.00	88.50	11.00
14	14	12½	105.00	110.50	11.00
15	14½	12½	120.00	127.00	11.00
16	15¼	12½	135.00	143.00	11.00
18xx	15½	15	157.00	166.00	18.00
20xx	16¾	15	180.00	190.00	18.00
22xx	17¾	17½	225.00	238.00	18.00
24xx	18¾	17½	285.00	300.00	18.00

*For diameter of regular flanges, see templates for drilling. The dimensions across the flat edges of square base flange are the same as the diameter of round base flange.

xx With round base only.

BASE TEES

Base tees made to order. Sizes, dimensions and prices on application.

CAST IRON FITTINGS

EXTRA HEAVY-FLANGED
FOR STEAM WORKING PRESSURES TO 250 LBS.

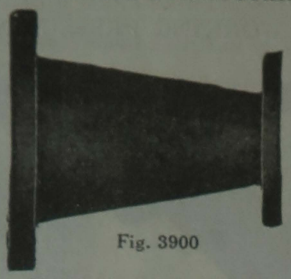


Fig. 3900

TAPER REDUCERS

Size, Inches	Face to Face, Inches	Faced, Each	Faced and Drilled, Each	Size, Inches	Face to Face, Inches	Faced, Each	Faced and Drilled, Each
2½x2	..	$9.50	$10.40	7x3	10	$31.50	$33.75
3 x2	6	10.25	11.35	7x4	10	31.50	33.75
3½x2½	6½	12.25	13.50	7x5	10	31.50	33.75
4 x2	7	13.50	15.00	7x6	10	31.50	33.75
4 x2½	7	13.50	15.00	8x3	11	36.00	38.50
4 x3	7	13.50	15.00	8x4	11	36.00	38.50
5 x2	8	18.75	20.25	8x5	11	36.00	38.50
5 x2½	8	18.75	20.25	8x6	11	36.00	38.50
5 x3	8	18.75	20.25	10x4	12	57.00	61.00
5 x4	8	18.75	20.25	10x5	12	57.00	61.00
6 x3	9	22.75	24.75	10x6	12	57.00	61.00
6 x3½	9	22.75	24.75	10x8	12	57.00	61.00
6 x4	9	22.75	24.75	12x5	14	84.00	88.50
6 x5	9	22.75	24.75	12x6	14	84.00	88.50
12x 8	14	$84.00	$88.50	18x12	19	$157.00	$166.00
12x10	14	84.00	88.50	18x14	19	157.00	166.00
14x 6	16	105.00	110.50	18x16	19	157.00	166.00
14x 8	16	105.00	110.50	20x12	20	180.00	190.00
14x10	16	105.00	110.50	20x14	20	180.00	190.00
14x12	16	105.00	110.50	20x16	20	180.00	190.00
15x 8	17	120.00	127.00	20x18	20	180.00	190.00
15x10	17	120.00	127.00	22x14	22	225.00	238.00
15x12	17	120.00	127.00	22x16	22	225.00	238.00
15x14	17	120.00	127.00	22x18	22	225.00	238.00
16x 8	18	135.00	143.00	22x20	22	225.00	238.00
16x10	18	135.00	143.00	24x16	24	285.00	300.00
16x12	18	135.00	143.00	24x18	24	285.00	300.00
16x14	18	135.00	143.00	24x20	24	285.00	300.00
18x10	19	157.00	166.00	24x22	24	285.00	300.00

Fig. 3901

Fig. 3902

DOUBLE BRANCH ELBOWS

Size, Inches	Straight Faced, Each	Straight Faced and Drilled, Each	Reducing Faced, Each	Reducing Faced and Drilled, Each
4	$35.75	$38.00	$39.75	$42.00
5	42.75	45.00	47.75	50.00
6	49.50	52.50	54.50	57.50
7	56.50	60.00	62.50	66.00
8	66.25	70.00	73.75	77.50
10	84.00	90.00	94.00	100.00

Furnished face only, unless otherwise ordered.
Larger Sizes made to order. Prices on Application.

CAST IRON COMPANION FLANGES

EXTRA HEAVY
FOR STEAM WORKING PRESSURES TO 250 LBS.

Fig. 3903
Back View Showing Hub

Fig. 3904
Smooth Face

Fig. 3905
Blind or Solid

Pipe Size and O.D. Flange, Inches	THREADED Faced, Each	THREADED Faced and Drilled, Each	BLIND OR SOLID Outside Diameter, Inches	BLIND OR SOLID Faced, Each	BLIND OR SOLID Faced and Drilled, Each
1 x 4½	$0.95	$1.30	4½	....	....
1¼x 5	1.00	1.35	5	....	....
1½x 6	1.10	1.45	6	$1.65	$2.00
2 x 6½	1.25	1.60	6½	1.90	2.25
2½x 7½	1.40	1.75	7½	2.10	2.45
3 x 8¼	1.60	2.05	8¼	2.40	2.85
3½x 9	2.00	2.55	9	3.00	3.55
4 x10	2.25	2.95	10	3.35	4.05
4½x10½	2.40	3.10	10½	3.60	4.30
5 x11	2.65	3.35	11	4.00	4.70
6 x12½	3.30	4.05	12½	5.00	5.75
7 x14	4.40	5.30	14	6.60	7.50
8 x15	5.10	6.15	15	7.65	8.70
9 x16¼	6.30	7.50	16¼	9.50	10.70
10 x17½	7.40	8.90	17½	11.00	12.50
12 x20½	10.75	12.50	20½	16.00	17.75
14 x23	15.00	17.00	23	22.50	24.50
15 x24½	19.00	21.50	24½	28.50	31.00
16 x25½	22.25	25.00	25½	33.50	36.25
18 x28	26.00	29.00	28	39.00	42.00
20 x30½	31.00	35.00	30½	46.00	50.00
22 x33	36.00	41.00	33	54.00	59.00
24 x36	45.00	50.00	36	67.00	72.00

Furnished plain faced, unless otherwise ordered.

1/32-inch raised face inside of the bolt holes, and projecting face turned off smooth for thin copper gasket; also 1/16-inch raised face inside of the bolt holes and the projecting face finished very smooth and polished at the factory, ready for grinding, can be furnished when specified on order, at special price.

NET PRICES FOR SPOT FACING BOLT HOLES AND BOLTING ON COMPANION FLANGES

Size Fitting, Inches	Bolting on Flange not Including Bolts or Gasket, Per Flange	Spot Facing Holes, Per Flange	Size of Fitting, Inches	Bolting on Flange not Including Bolts or Gasket, Per Flange	Spot Facing Holes, Per Flange
1¼	$0.10	$0.20	8	$0.20	$0.60
1½	.10	.20	9	.20	.60
2	.10	.20	10	.20	.80
2½	.10	.20	12	.25	.80
3	.15	.40	14	.25	1.00
3½	.15	.40	15	.25	1.00
4	.15	.40	16	.25	1.00
4½	.15	.40	18	.25	1.20
5	.15	.40	20	.25	1.20
6	.20	.60	22	.25	1.40
7	.20	.60	24	.25	1.40

The above net prices apply to both straight and reducing sizes.

Gaskets will only be furnished when specified and at an extra price.

REDUCING COMPANION FLANGES

CAST IRON—EXTRA HEAVY
FOR STEAM WORKING PRESSURES TO 250 LBS.

Fig. 3906

These flanges, used in connection with straight or reducing fittings, enable us to fill orders for reduced sizes very promptly. Customers who desire fittings reduced in this manner will please specify "Reduce by Flanges if Necessary."

These flanges will always be the same thickness as the regular companion flanges of corresponding outside diameter.

The flanges are always drilled to the template corresponding to the outside diameter, unless otherwise ordered.

In ordering reducing companion flanges, always give the screwed or reduced size first, then the outside diameter of flange wanted.

Size, Inches	Faced, Each	Faced and Drilled, Each	Size, Inches	Faced, Each	Faced and Drilled, Each
1¼x 6	$1.80	$2.15	4x16¼	$10.50	$11.70
1½x 6½	2.10	2.45	5x16¼	10.50	11.70
1½x 7½	2.30	2.65	6x16¼	10.50	11.70
2 x 7½	2.30	2.65	7x16¼	10.50	11.70
1½x 8¼	2.65	3.10	8x16¼	10.50	11.70
2 x 8¼	2.65	3.10	5x17½	12.00	13.50
2½x 8¼	2.65	3.10	6x17½	12.00	13.50
2 x 9	3.30	3.85	7x17½	12.00	13.50
2½x 9	3.30	3.85	8x17½	12.00	13.50
3 x 9	3.30	3.85	9x17½	12.00	13.50
2 x10	3.70	4.40	6x20½	17.50	19.25
2½x10	3.70	4.40	7x20½	17.50	19.15
3 x10	3.70	4.40	8x20½	17.50	19.25
3½x10	3.70	4.40	9x20½	17.50	19.25
2 x10½	4.00	4.70	10x20½	17.50	19.25
2½x10½	4.00	4.70	8x23	25.00	27.00
3 x10½	4.00	4.70	9x23	25.00	27.00
3½x10½	4.00	4.70	10x23	25.00	27.00
4 x10½	4.00	4.70	12x23	25.00	27.00
2 x11	4.40	5.10	8x24½	31.50	34.00
2½x11	4.40	5.10	10x24½	31.50	34.00
3 x11	4.40	5.10	12x24½	31.50	34.00
3½x11	4.40	5.10	14x24½	31.50	34.00
4 x11	4.40	5.10	10x25½	37.00	39.75
4½x11	4.40	5.10	12x25½	37.00	39.75
2 x12½	5.50	6.25	14x25½	37.00	39.75
2½x12½	5.50	6.25	15x25½	37.00	39.75
3 x12½	5.50	6.25	12x28	43.00	46.00
4 x12½	5.50	6.25	14x28	43.00	46.00
4½x12½	5.50	6.25	15x28	43.00	46.00
5 x12½	5.50	6.25	16x28	43.00	46.00
4½x14	7.25	8.15	14x30½	51.00	55.00
5 x14	7.25	8.15	15x30½	51.00	55.00
6 x14	7.25	8.15	16x30½	51.00	55.00
3 x15	8.40	9.45	18x30½	51.00	55.00
3½x15	8.40	9.45	16x33	60.00	65.00
4 x15	8.40	9.45	18x33	60.00	65.00
5 x15	8.40	9.45	20x33	60.00	65.00
6 x15	8.40	9.45	18x36	74.00	79.00
7 x15	8.40	9.45	20x36	74.00	79.00

These flanges are the same thickness and are drilled to the same templates as regular companion flanges of corresponding outside diameters. Furnished faced only, unless otherwise ordered.

DIMENSIONS AND TEMPLATES FOR DRILLING EXTRA HEAVY CAST IRON COMPANION FLANGES

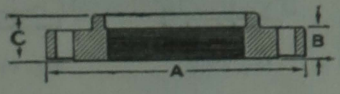


Fig. 3907

American Standard in Effect Jan. 1st, 1915

Size, Inches	Diameter of Flanges, Inches	Thickness of Flanges, Inches	Bolt Circle, Inches
1	4½	11/16	3¼
1¼	5	¾	3¾
1½	6	13/16	4½
2	6½	⅞	5
2½	7½	1	5⅞
3	8¼	1⅛	6⅝
3½	9	1³/₁₆	7¼
4	10	1¼	7⅞
4½	10½	1⁵/₁₆	8½
5	11	1⅜	9¼
6	12½	1⁷/₁₆	10⅝
7	14	1½	11⅞
8	15	1⅝	13
9	16¼	1¾	14
10	17½	1⅞	15¼
12	20½	2	17¾
14	23	2⅛	20¼
15	24½	2³/₁₆	21½
16	25½	2¼	22½
18	28	2⅜	24¾
20	30½	2½	27
22	33	2⅝	29¼
24	36	2¾	32

BOLT SIZES

Size, Inches	Number of Bolts	Size of Bolts, Inches	Length of Bolts, Inches
1	4	½	2
1¼	4	½	2¼
1½	4	⅝	2½
2	4	⅝	2½
2½	4	¾	3
3	8	¾	3¼
3½	8	¾	3¼
4	8	¾	3½
4½	8	¾	3½
5	8	¾	3¾
6	12	¾	3¾
7	12	⅞	4
8	12	⅞	4¼
9	12	1	4¾
10	16	1	5
12	16	1⅛	5¼
14	20	1⅛	5½
15	20	1¼	5¾
16	20	1¼	6
18	24	1¼	6¼
20	24	1⅜	6¾
22	24	1½	7
24	24	1⅝	7½

These drilling templates are in multiples of four, so that fittings may be made to face in any quarter and bolt holes straddle the center line. Bolt holes are drilled ⅛ inch larger than nominal diameter of bolt.

GENERAL DIMENSIONS OF EXTRA HEAVY FLANGED FITTINGS

FOR STEAM WORKING PRESSURE TO 250 LBS.

STRAIGHT SIZES

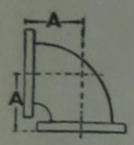


Fig. 3908

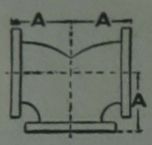


Fig. 3909

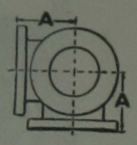


Fig. 3910

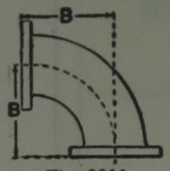


Fig. 3911

Fig. 3912

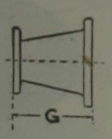


Fig. 3913

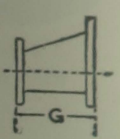


Fig. 3914

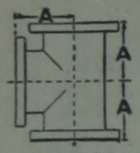


Fig. 3915

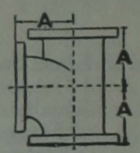


Fig. 3916

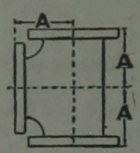


Fig. 3917

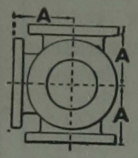


Fig. 3918

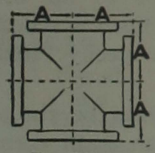


Fig. 3919

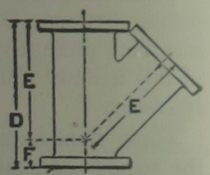


Fig. 3920

Flanged fittings are drilled in multiples of four, so that they may be made to face in any quarter and bolt holes straddle center line.

Unless otherwise specified, we will always furnish extra heavy flanged fittings and companion flanges, with 1/16-inch raised face, for which we make no extra charge.

Dimensions are regulated by the size of outlet.

Fittings reducing on the run only, the long body pattern will always be used, except double sweep tees, on which the reduced end (dimension on request) is always longer than the regular fitting.

Bull heads or tees having outlet larger than the run will be the same length center to face of all openings as a tee with all openings of the size of the outlet.

LONG BODY PATTERN

Size, Inches	1¼	1½	2	2½	3	3½	4	4½	5	6	7
AA-Face to Face, Tees and Crosses, Inches	8½	9	10	11	12	13	14	15	16	17	18
A-Center to Face, Elbows, Tees and Crosses, Ins.	4¼	4½	5	5½	6	6½	7	7½	8	8½	9
B-Center to Face, Long Radius Elbows, Inches	5½	6	6½	7	7¾	8½	9	9½	10¼	11½	12¾
C-Center to Face, 45 Degree Elbows, Inches	2½	2¾	3	3½	3½	4	4½	4½	5	5½	6
D-Face to Face, Laterals, Inches	9½	11	11½	13	14	15½	16½	18	18½	21½	23½
E-Center to Face, Laterals, Inches	7¼	8½	9	10½	11	12½	13½	14½	15	17½	19
F-Center to Face, Laterals, Inches	2¼	2½	2½	2½	3	3	3	3½	3½	4	4½
G-Face to Face, Reducers, Inches					6	6½	7	7½	8	9	10
Diameter of Flanges, Inches	5	6	6½	7½	8¼	9	10	10½	11	12½	14
Thickness of Flanges, Inches	¾	13/16	⅞	1	1⅛	1 3/16	1¼	1 5/16	1⅜	1 7/16	1½

Size, Inches	8	9	10	12	14	15	16	18	20	22	24
AA-Face to Face, Tees and Crosses, Inches	20	21	23	26	30	31	33	36	39	41	45
A-Center to Face, Elbows, Tees and Crosses, Ins.	10	10½	11½	13	15	15½	16½	18	19½	20½	22½
B-Center to Face, Long Radius Elbows, Inches	14	15¼	16½	19	21½	22¾	24	26½	29	31½	34
C-Center to Face, 45 Degree Elbows, Inches	6	6½	7	8	8½	9	9½	10	10½	11	12
D-Face to Face, Laterals, Inches	25½	27½	29½	33½	37½	39½	42	45½	49	53	57½
E-Center to Face, Laterals, Inches	20½	22½	24	27½	31	33	34½	37½	40½	43½	47½
F-Center to Face, Laterals, Inches	5	5	5½	6	6½	6½	7½	8	8½	9½	10
G-Face to Face, Reducers, Inches	11	11½	12	14	16	17	18	19	20	22	24
Diameter of Flanges, Inches	15	16¼	17½	20½	23	24½	25½	28	30½	33	36
Thickness of Flanges, Inches	1⅝	1¾	1⅞	2	2⅛	2 3/16	2¼	2⅜	2½	2⅝	2¾

REDUCING SIZES 18 INCHES AND LARGER

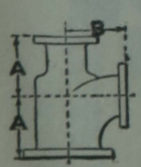


Fig. 3921

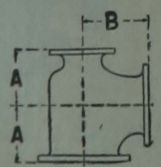


Fig. 3922

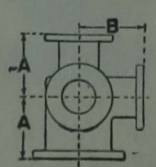


Fig. 3923

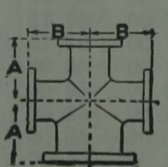


Fig. 3924

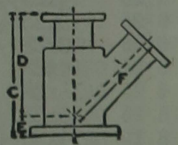


Fig. 3925

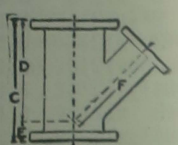


Fig. 3926

SHORT BODY PATTERN

REDUCING TEES AND CROSSES

Size, Inches	18	20	22	24
Size of Outlets and Smaller, Inches	12	14	15	16
AA-Face to Face of Run, Inches	28	31	33	34
A-Center to Face of Run, Inches	14	15½	16½	17
B-Center to Face of Outlet, Inches	17	18½	20	21½

REDUCING LATERALS

Size, Inches	18	20	22	24
Size of Branch and Smaller, Inches	9	10	10	12
C-Face to Face, Run, Inches	34	37	40	44
D-Center to Face, Run, Inches	31	34	37	41
E-Center to Face, Run, Inches	3	3	3	3
F-Center to Face, Branch, Inches	32½	36	39	43

All reducing fittings 1¼ to 16 inches, inclusive, have same center to face dimensions as straight size fittings.

Long body patterns are used when branches are larger than given in above table, therefore have same dimensions as straight size fittings.

WROUGHT NIPPLES

RIGHT HAND

Fig. 3927

CLOSE

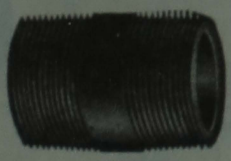


Fig. 3928

SHORT

BLACK

Size, Inches	Length, Inches						Each		Extra Long Nipples, Each								
	Close	Short	Long				Close or Short	Long	Length, Inches								
									4	5	6	7	8	9	10	11	12
1/8	3/4	1 1/2	2	2 1/2	3	3 1/2	$0.04	$0.06	$0.07	$0.08	$.10	$0.12	$0.14	$0.15	$0.17	$0.18	$0.19
1/4	7/8	1 1/2	2	2 1/2	3	3 1/2	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19
3/8	1	1 1/2	2	2 1/2	3	3 1/2	.04	.06	.07	.08	.10	.12	.14	.15	.17	.18	.19
1/2	1 1/8	1 1/2	2	2 1/2	3	3 1/2	.05	.07	.08	.10	.12	.14	.16	.18	.20	.22	.23
3/4	1 3/8	2	2 1/2	3	3 1/2	4	.06	.09	....	.11	.13	.17	.18	.20	.22	.24	.26
1	1 1/2	2	2 1/2	3	3 1/2	4	.08	.13	....	.15	.18	.23	.25	.28	.31	.34	.36
1 1/4	1 5/8	2 1/2	3	3 1/2	4	4 1/2	.11	.17	....	.20	.24	.29	.33	.36	.40	.44	.47
1 1/2	1 3/4	2 1/2	3	3 1/2	4	4 1/2	.13	.20	....	.25	.29	.36	.40	.45	.50	.54	.59
2	2	2 1/2	3	3 1/2	4	4 1/2	.18	.27	....	.32	.38	.50	.54	.59	.65	.72	.77
2 1/2	2 1/2	3	3 1/2	4	4 1/2	5	.39	.59	....	....	.68	.90	.97	1.06	1.17	1.26	1.35
3	2 5/8	3	3 1/2	4	4 1/2	5	.48	.72	....	....	.85	1.08	1.20	1.33	1.45	1.58	1.70
3 1/2	2 3/4	4	4 1/2	5	5 1/2	6	.75	1.05	....	....	....	1.30	1.45	1.60	1.75	1.90	2.05
4	2 7/8	4	4 1/2	5	5 1/2	6	.85	1.20	....	....	....	1.52	1.69	1.87	2.05	2.22	2.40
4 1/2	2 7/8	4	4 1/2	5	5 1/2	6	1.25	1.70	....	....	....	2.25	2.50	2.75	2.95	3.17	3.40
5	3	4 1/2	5	5 1/2	6	6 1/2	1.55	2.45	....	....	....	2.58	2.83	3.10	3.35	3.60	3.85
6	3 1/8	4 1/2	5	5 1/2	6	6 1/2	1.85	2.90	....	....	....	3.05	3.35	3.70	4.00	4.30	4.65
7	3 1/4	5	....	....	....	....	3.20	....	....	....	3.60	4.05	4.45	4.90	5.30	5.75	6.15
8	3 1/2	5	....	....	....	....	3.55	....	....	....	4.05	4.55	5.05	5.50	6.00	6.50	7.00
9	3 5/8	5	....	....	....	....	5.25	....	....	....	....	....	6.50	7.10	7.75	8.40	9.00
10	3 7/8	5	....	....	....	....	6.75	....	....	....	....	....	6.25	8.90	9.70	10.40	11.10
12	4 1/2	6	....	....	....	....	8.00	....	....	....	....	....	10.00	10.80	11.75	12.70	13.65

GALVANIZED

Size, Inches	Length, Inches						Each		Extra Long Nipples, Each								
	Close	Short	Long				Close or Short	Long	Length, Inches								
									4	5	6	7	8	9	10	11	12
1/8	3/4	1 1/2	2	2 1/2	3	3 1/2	$0.06	$0.11	$0.12	$0.15	$0.17	$0.21	$0.24	$0.26	$0.29	$0.31	$ .34
1/4	7/8	1 1/2	2	2 1/2	3	3 1/2	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34
3/8	1	1 1/2	2	2 1/2	3	3 1/2	.06	.11	.12	.15	.17	.21	.24	.26	.29	.31	.34
1/2	1 1/8	1 1/2	2	2 1/2	3	3 1/2	.06	.11	.13	.16	.18	.23	.26	.28	.31	.33	.39
3/4	1 3/8	2	2 1/2	3	3 1/2	4	.08	.14	....	.18	.21	.26	.29	.32	.35	.38	.41
1	1 1/2	2	2 1/2	3	3 1/2	4	.11	.19	....	.24	.28	.34	.38	.42	.47	.51	.55
1 1/4	1 5/8	2 1/2	3	3 1/2	4	4 1/2	.17	.29	....	.32	.38	.45	.51	.57	.63	.69	.75
1 1/2	1 3/4	2 1/2	3	3 1/2	4	4 1/2	.21	.35	....	.39	.46	.55	.63	.70	.77	.84	.91
2	2	2 1/2	3	3 1/2	4	4 1/2	.27	.47	....	.52	.61	.74	.83	.93	1.03	1.13	1.23
2 1/2	2 1/2	3	3 1/2	4	4 1/2	5	.56	.86	....	....	1.00	1.26	1.41	1.56	1.71	1.86	2.01
3	2 5/8	3	3 1/2	4	4 1/2	5	.70	1.10	....	....	1.30	1.60	1.80	2.00	2.20	2.40	2.60
3 1/2	2 3/4	4	4 1/2	5	5 1/2	6	1.20	1.70	....	....	....	2.10	2.35	2.60	2.85	3.15	3.40
4	2 7/8	4	4 1/2	5	5 1/2	6	1.35	1.87	....	....	....	2.30	2.60	2.90	3.20	3.50	3.80
4 1/2	2 7/8	4	4 1/2	5	5 1/2	6	1.85	2.60	....	....	....	3.30	3.65	4.05	4.45	4.85	5.25
5	3	4 1/2	5	5 1/2	6	6 1/2	2.30	3.15	....	....	....	3.75	4.20	4.60	5.00	5.40	5.85
6	3 1/8	4 1/2	5	5 1/2	6	6 1/2	2.80	4.25	....	....	....	4.50	5.00	5.55	6.05	6.60	7.15
7	3 1/4	5	....	....	....	....	4.25	....	....	....	4.95	5.65	6.35	7.05	7.75	8.45	9.20
8	3 1/2	5	....	....	....	....	5.00	....	....	....	5.80	6.65	7.50	8.35	9.25	10.10	10.95

These lengths conform to the Manufacturers' Standard.

Nipples made to order from extra strong pipe at double the above list. Nipples made longer than 12 inches are charged as cut pipe with extra for threads.

WROUGHT NIPPLES

BLACK—RIGHT AND LEFT-HAND

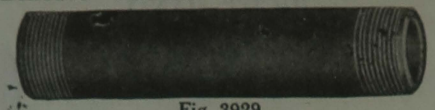


Fig. 3929

Size, Inches	Length, Inches: Close	Short	Long				Each: Close or Short	Each: Long	Extra Long Nipples, Each — Length, Inches: 4	5	6	7	8	9	10	11	12
1/2	3/4	1 1/2	2	2 1/2	3	3 1/2	$0.05	$0.08	$0.09	$0.11	$0.13	$0.16	$0.18	$0.20	$0.23	$0.25	$0.27
1/2	7/8	1 1/2	2	2 1/2	3	3 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27
1/2	1	1 1/2	2	2 1/2	3	3 1/2	.05	.08	.09	.11	.13	.16	.18	.20	.23	.25	.27
1/4	1 1/8	1 1/2	2	2 1/2	3	3 1/2	.07	.10	.11	.13	.16	.18	.21	.24	.27	.29	.31
1/8	1 3/8	2	2 1/2	3	3 1/2	4	.08	.12	.....	.15	.17	.23	.25	.27	.29	.32	.35
1	1 1/2	2	2 1/2	3	3 1/2	4	.11	.18	.....	.20	.24	.31	.33	.37	.41	.45	.48
1 1/4	1 5/8	2 1/2	3	3 1/2	4	4 1/2	.15	.23	.....	.27	.32	.39	.45	.50	.55	.60	.65
1 3/8	1 3/4	2 1/2	3	3 1/2	4	4 1/2	.18	.27	.....	.34	.39	.48	.52	.60	.67	.72	.80
2	2	2 1/2	3	3 1/2	4	4 1/2	.24	.36	.....	.43	.51	.67	.72	.80	.87	.96	1.03
2 1/2	2 1/2	3	3 1/2	4	4 1/2	5	.52	.79	.....	.....	.91	1.20	1.30	1.40	1.55	1.68	1.80
3	2 5/8	3	3 1/2	4	4 1/2	5	.65	.96	.....	.....	1.13	1.44	1.60	1.77	1.93	2.10	2.27
3 3/4	2 3/4	4	4 1/2	5	5 1/2	6	1.00	1.40	.....	.....	.....	1.75	1.95	2.15	2.35	2.55	2.75
4	2 7/8	4	4 1/2	5	5 1/2	6	1.15	1.60	.....	.....	.....	2.00	2.25	2.50	2.75	3.00	3.25

Add 60 per cent to above prices for galvanized right and left hand nipples.

WROUGHT NIPPLES

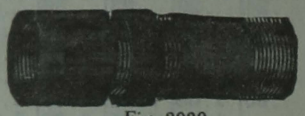


Fig. 3930

LONG SCREW

WITH COUPLING AND LOCKNUT, FACED

Size, Inches	1/4	3/8	1/2	3/4	1	1 1/4
Length, Inches	2 1/2	3	3 1/2	4	4 1/2	5
Each, Black	$0.30	.35	.40	.55	.75	1.00
Each, Galvanized	$0.35	.40	.50	.66	1.00	1.25

Size, Inches	1 1/2	2	2 1/2	3	3 1/2	4
Length, Inches	5 1/2	6	7	8	8 1/2	9
Each, Black	$1.30	1.70	2.70	3.70	5.40	6.60
Each, Galvanized	$1.60	2.10	3.10	4.70	6.50	7.75

STANDARD COUPLINGS

WROUGHT-IRON

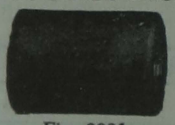


Fig. 3931

Size Pipe, Ins.	Out-Side Diam. Ins.	Lgth. Ins.	Wgt. Per 100, Lbs.	Right Hand Black, Each	Right Hand Galv. Each	R. & L. Hand Black, Each	R. & L. Hand Galv. Each
1/2	19/32	15/16	3	$0.05	$0.06	$0.07	$0.08
1/2	3/4	1 1/32	7	.05	.06	.07	.08
1/2	19/32	1 5/32	11	.06	.08	.08	.10
1/2	1 3/32	1 5/16	15	.07	.10	.11	.14
1/4	1 11/32	1 9/16	25	.10	.13	.15	.18
1	1 5/8	1 13/16	42	.13	.18	.20	.23
1 3/4	1 31/32	2 1/16	60	.17	.25	.25	.33
1 1/2	2 15/64	2 5/16	81	.21	.32	.30	.41
2	2 23/32	2 9/16	118	.28	.40	.50	.62
2 3/8	3 5/16	2 7/8	170	.40	.55	.85	1.00
3	3 15/16	3 1/16	245	.60	.80	1.20	1.40
3 1/4	4 7/16	3 7/16	340	.80	1.05	1.60	1.90
4	4 15/16	3 7/16	350	1.00	1.40	2.00	2.40
4 1/8	5 17/32	3 5/8	470	1.50	2.00	8.20	8.75
5	6 1/4	4 1/8	850	1.65	2.25	9.00	9.65
6	7 9/32	4 1/8	970	2.40	3.25	12.50	13.35
7	8 9/32	4 1/8	1110	3.25	4.20	13.00	13.95
8	9 1/4	4 5/8	1360	4.25	5.50	17.00	18.25
9	10 5/16	5 1/8	1740	5.50	7.00	17.50	19.00
10	11 3/8	6 1/8	3110	7.50	9.75	23.00	25.25
12	13 7/8	6 1/8	4420	10.00	13.65	28.00	31.65

BOILER FITTINGS

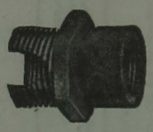


Fig. 3932

Fig. 3933

Coupling

Size, Inches	3/4x3/4x1	3/4x1/2x1	1/2x1/2x1
Elbows, Galvanized, Each	$0.40	.40	.40
Union Elbows, Galvanized, Ea.	$0.75	.75	.60
Coupling, Galvanized, Each	$0.40	.40	.40
Union Coupling, Galv., Each	$0.75	.75	.60
Tees, Galvanized, Each	...	$0.50	...
Union Tees, Galvanized, Each	...	$0.80	...

FUSIBLE BOILER PLUGS

Fig. 3934

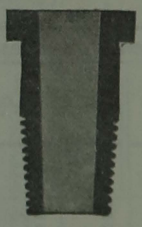


Fig. 3935

Fig. 3936

	Short Pattern Outside Plug	Long Pattern Inside Plug	Mass. Std. Tube Plug
Size, Inches	3/8	1/2	3/4
Regular Short, Each	$0.50	.60	.75
U. S. Standard Short, Each	$0.50	.60	....
Mass. Standard Tube Plug, Each		$0.50	....
U. S. Standard Long, Each		....	$1.50
Mass. Standard Long, Each		$1.20	1.50

Size, Inches	1	1 1/4	1 1/2	2
Regular Short, Each	$1.00	1.50	2.00	3.00
U. S. Standard Long, Each	$2.00	3.00	4.00	6.00
Mass. Standard Long, Each	$2.00	3.00	4.00	6.00

Long pattern plugs comply with the U. S. Government rules and various state laws which require a 1-inch extension.

All our fusible plugs are filled with pure tin and should be inserted so as to have the large end of the tin exposed to the water.

MALLEABLE IRON FITTINGS

Classification and List Adopted June 5, 1907.

Fig. 3937

Fig. 3938

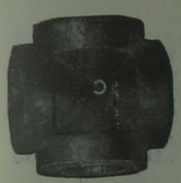


Fig. 3939

Fig. 3940

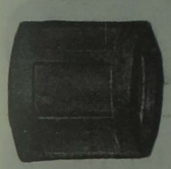


Fig. 3941

Fig. 3942

Fig. 3943

Fig. 3944

CLASS	A Size, Inches	B Size, Inches	C Size, Inches
ELBOWS			
Straight and Reducing	1/8x1/8, 1/4x1/8, 3/8x1/8, 1/4x3/8	1/4x1/4, 3/8x3/8, 3/8x1/4, 1/2x1/4, 1/2x1/2, 1/2x3/8	3/4 and Larger
Right and Left		1/2, 3/4 and 1	1 1/4 and Larger
45°	1/8	1/4 to 2 Inclusive	2 1/2 and Larger
Street	1/8	1/4 to 1x3/4, Inclusive	1 and Larger
Street 45°	3/8	1/2 to 2, Inclusive	
Side Outlet		All Sizes	
Drop		All Sizes	
TEES		1/4, 3/8, 1/2	
Straight and Reducing	1/8x1/8, 1/4x1/8, 1/8x1/4, 3/8x1/8, 1/4x1/8x1/8	3/8x1/4x3/8, 3/8x3/8x1/4, 1/4x3/8, 3/8x1/4x1/4 1/2 Reduc'g	3/4 and Larger
Service		3/8, 1/2, 3/4, 1x1x3/4, 3/4x1/2x3/4, 1x3/4x1, 1x3/4x3/4	1 and Larger
Four Way		All Sizes	
Drop		All Sizes	
CROSSES			
Straight		1/4 to 1, Inclusive	1 1/4 and Larger
Reducing		1 and Smaller	1 1/4 and Larger
Y BRANCHES		All Sizes	
RETURN BENDS		3/8 to 1, Inclusive	1 1/4 and Larger
Right Hand	3/8 and 1/2	3/4 and Larger	
Right and Left Hand			
COUPLINGS	1/8	1/4 to 3/4, Inclusive	1 and Larger
Right Hand	1/8	1/4 to 3/4, Inclusive	1 and Larger
Right and Left Hand	1/4x1/8, 3/8x1/8, 1/2x1/8	3/8x1/4 to 1x3/4, Inclusive	1 1/4 and Larger
Reducing			
CAPS	1/8	1/4 to 1, Inclusive	1 1/4 and Larger
LOCK NUTS	1/8	1/4 to 1 1/4, Inclusive	1 1/2 and Larger
EXTENSION PIECES		All Sizes	
WASTE NUTS		All Sizes	
CHANDELIER HOOKS		All Sizes	
CHANDELIER LOOPS		All Sizes	
CLASS	A	B	C
Black, Per Pound	$0.40	$0.20	$0.13
Galvanized, Per Pound	.50	.28	.20

Fittings in Class C, having one or more outlets smaller than 3/4 inch, will be charged in Class B.

The run of tees gives the sizes for the purpose of classification and the outlet being larger does not, change it.

In ordering, be particular to state whether banded or plain.

An extra charge will be made for fittings not enumerated in standard list.

Right and left hand fittings not classified take one class higher than right hand.

Fittings 4 1/2 inch and larger have special discount.

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

ELBOWS STRAIGHT AND REDUCING RIGHT HAND

Fig. 3945

Size, Inches	1/8	1/4	3/8
Class	A	B	B
Weight per 100, Lbs.	6	9	18½
Each, Black	$0.06	.07	.08
Each, Galvanized	$0.08	.09	.11

Size, Inches	1/2	3/4	1	1¼
Class	B	C	C	C
Weight per 100, Lbs	19	28	48	86
Each, Black	$0.10	.15	.22	.25
Each, Galvanized	$0.14	.20	.22	.40

Size, Inches	1½	2	2½	3
Class	C	C	C	C
Weight per 100, Lbs	112	187	335	550
Each, Black	$0.35	.50	.90	1.50
Each, Galvanized	$0.60	.90	1.50	2.60

Size, Inches	3½	4	4½	5	6
Class	C	C	C	C	C
Weight per 100, Lbs	700	950	1325	1800	2500
Each, Black	$2.25	3.00	3.50	4.00	6.50
Each, Galvanized	$3.75	5.00	5.50	6.50	10.00

RIGHT AND LEFT HAND

Size, Inches	1/4	3/8	1/2	3/4
Class	A	A	B	B
Weight per 100, Lbs.	9	18½	19	28
Each, Black	$0.09	.11	.13	.17
Each, Galvanized	$0.12	.16	.17	.23

Size, Inches	1	1¼	1½	2
Class	B	C	C	C
Weight per 100, Lbs.	48	86	112	187
Each, Black	$0.25	.30	.40	.65
Each, Galvanized	$0.35	.45	.65	1.00

45° ELBOWS

Fig. 3946

Size, Inches	1/4	3/8	1/2
Class	B	B	B
Weight per 100, Lbs.	8	12½	20
Each, Black	$0.08	.10	.12
Each, Galvanized	$0.12	.15	.20

Size, Inches	3/4	1	1¼	1½
Class	B	B	B	B
Weight per 100, Lbs.	30	50	80	110
Each, Black	$0.18	.26	.36	.54
Each, Galvanized	$0.25	.40	.50	.85

Size, Inches	2	2½	3	3½
Class	B	C	C	C
Weight per 100, Lbs.	140	250	408	510
Each, Black	$0.82	1.25	2.50	3.25
Each, Galvanized	$1.35	1.90	3.75	4.75

Size, Inches	4	4½	5	6
Class	C	C	C	C
Weight per 100, Lbs.	700	950	1250	2050
Each, Black	$4.50	5.25	6.00	7.50
Each, Galvanized	$6.75	7.50	9.00	11.00

60° ELBOWS

Size, Inches	1¼	1½	2
Class	B	B	B
Weight per 100, Lbs.	81	104	160
Each, Black	$0.30	.45	.65
Each, Galvanized	$0.45	.70	1.05

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

STREET ELBOWS

Fig. 3947

Size, Inches	1/8	1/4	3/8
Class	A	B	B
Weight per 100, Lbs.	7	9	16
Each, Black	$0.08	.10	.10
Each, Galvanized	$0.10	.12	.12

Size, Inches	1/2	3/4	1	1¼
Class	B	B	C	C
Weight per 100, Lbs.	24	35	63	98
Each, Black	$0.12	.20	.25	.40
Each, Galvanized	$0.15	.28	.35	.55

Size, Inches	1½	2	2½	3	4
Class	C	C	C	C	C
Weight per 100, Lbs.	130	220	350	500	525
Each, Black	$0.55	.90	1.50	2.25	3.50
Each, Galvanized	$0.80	1.30	2.25	3.50	....

45° STREET ELBOWS

Size, Inches	1/8-3/8	1/2	3/4	1
Class	A	B	B	B
Weight per 100, Lbs.	15	22	34	53
Each, Black	$0.12	.12	.20	.25
Each, Galvanized	$0.15	.15	.28	.35

Size, Inches	1¼	1½	2	3	4
Class	B	B	B	B	B
Weight per 100, Lbs.	95	105	140	408	700
Each, Black	$0.40	.55	.90	2.25	3.50
Each, Galvanized	$0.55	.80	1.30	....	....

SIDE OUTLET ELBOWS

Fig. 3948

Size, Inches	1/4-3/8	1/2	3/4
Class	B	B	B
Weight per 100, Lbs.	16	25	39
Each, Black	$0.08	.10	.18
Each, Galvanized	$0.10	.15	.25

Size, Inches	1	1¼	1½	2
Class	B	B	B	B
Weight per 100, Lbs.	66	105	155	232
Each, Black	$0.30	.45	.60	1.00
Each, Galvanized	$0.45	.65	.90	1.50

DROP ELBOWS—FEMALE

Fig. 3949

Size, Inches	1/4	3/8	1/2	3/4
Class	B	B	B	B
Wt. per 100, Lbs.	13	18	30	47
Each, Black	$0.06	.08	.12	.20
Each, Galvanized	$0.09	.12	.20	.35

SHORT DROP ELBOWS—MALE AND FEMALE

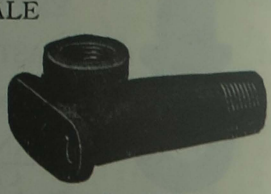


Fig. 3950

Size, Inches	3/8	1/2
Class	B	B
Wgt. per 100, Lbs.	21	32
Black, Each	$0.08	.12
Galvanized, Each	$0.12	.20

LONG DROP ELBOWS—MALE AND FEMALE

Size, Inches	1/4x3/8	3/8x3/8	1/2x3/8	1/2x1/2
Class	B	B	B	B
Length Drop, Inches	2⅜	2½	3⅛	3⅛
Weight per 100, Lbs.	20	26	38	39
Each, Black	$0.10	.10	.18	.18
Each, Galvanized	$0.18	.18	.27	.27

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

TEES
STRAIGHT AND REDUCING

Fig. 3951

Size, Inches	1/8	1/4	3/8
Class	A	B	B
Weight per 100, Lbs.	7	11	16
Each, Black	$0.07	.08	.09
Each, Galv	$0.09	.10	.13

Size, Inches	1/2	3/4	1	1 1/4
Class	B	C	C	C
Weight per 100, Lbs.	25	39	63	100
Each, Black	$0.11	.15	.25	.30
Each, Galvanized	$0.16	.20	.38	.50

Size, Inches	1 1/2	2	2 1/2	3
Class	C	C	C	C
Weight per 100, Lbs.	149	222	450	730
Each, Black	$0.45	.60	1.05	1.70
Each, Galvanized	$0.70	1.00	1.90	3.00

Size, Inches	3 1/2	4	4 1/2	5	6
Class	C	C	C	C	C
Weight per 100, Lbs.	920	1350	1700	2175	3050
Each, Black	$2.50	3.40	4.25	5.00	7.75
Each, Galvanized	$4.25	5.75	....	8.00	12.00

FOUR-WAY TEES

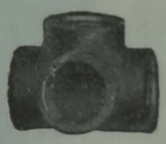


Fig. 3952

Size, Inches	3/8	1/2	3/4
Class	B	B	B
Weight per 100, Lbs.	17	35	43 1/2
Each, Black	$0.12	.14	.20
Each, Galvanized	$0.17	.20	.28

Size, Inches	1	1 1/4	1 1/2	2
Class	B	B	B	B
Weight per 100, Lbs.	72	120	180	260
Each, Black	$0.35	.50	.80	1.25
Each, Galvanized	$0.50	.70	1.10	1.75

SERVICE TEES

Fig. 3953

Size, Inches	3/8	1/2	3/4
Class	B	B	B
Wgt. per 100, Lbs.	20	28	50
Each, Black	$0.12	.15	.25
Each, Galvanized	$0.15	.20	.35

Size, Inches	1	1 1/4	1 1/2	2
Class	C	C	C	C
Weight per 100, Lbs.	80	132	178	320
Each, Black	$0.35	.50	.75	1.15
Each, Galvanized	$0.50	.70	1.10	1.65

Size, Inches	2 1/2	3	3x2 1/2x3	3x3x4
Class	C	C	C	C
Weight per 100, Lbs.	500	850	750	900
Each, Black	$2.00	2.50	2.50	4.00
Each, Galvanized	$2.75	3.50	.....	.....

DROP TEES—FEMALE

Fig. 3954

Size, Inches	3/8	1/2	3/4	1
Class	B	B	B	B
Weight per 100, Lbs.	20 1/2	32	50	85
Each, Black	$0.10	.14	.22	.30
Each, Galvanized	$0.15	.25	.40	.55

DROP TEES—MALE AND FEMALE

Size, Inches	3/8	1/2	3/4	1
Class	B	B	B	B
Weight per 100, Lbs.	23	34	52	88
Each, Black	$0.10	.14	.22	.30
Each, Galvanized	$0.15	.25	.40	....

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

LONG DROP TEES

Fig. 3955

Size, Inches	3/8		
Class	B		
Length Drop, Inches	2 1/2		
Weight per 100, Lbs.	28		
Each, Black	$0.12		
Each, Galvanized	$0.17		

Size, Inches	3/4x3/4x1/2	1x1x1/2	1 1/4x1 1/4x1/2
Class	B	B	B
Length Drop, Inches	3 1/8	3 3/8	3 3/4
Weight per 100, Lbs.	80	132	178
Each, Black	$0.30	.40	.60

In describing Tees the run is first named, then the outlet, thus:

$\frac{1/2}{3/4}T\ 1/2 = 1/2 \times 3/4$ $\qquad$ $\frac{1/2}{3/4}T\ 3/8 = 1/2 \times 3/8 \times 3/4$

CROSSES
STRAIGHT AND REDUCING

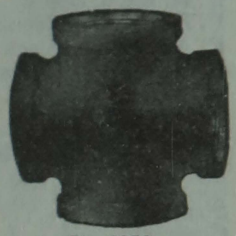


Fig. 3956

Size, Inches	1/4	3/8	1/2	3/4
Class	B	B	B	B
Wt. per 100 lbs.	12 1/2	18	29	45
Each, Black	$0.09	.10	.16	.20
Each, Galv.	$0.12	.14	.25	.29

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Class	B	C	C	C	C
Weight per 100, Lbs.	73	117	168	260	550
Each, Black	$0.30	.40	.60	1.00	1.75
Each, Galvanized	$0.45	.60	.90	1.50	2.75

Size, Inches	3	3 1/2	4	5	6
Class	C	C	C	C	C
Weight per 100, Lbs.	850	1300	1350	2550	2775
Each, Black	$3.00	3.25	5.25	7.50	13.00
Each, Galvanized	$4.50	5.00	8.00	.....	.....

45° Y BENDS
STRAIGHT AND REDUCING

Fig. 3957

Size, Inches	1/2	3/4
Class	B	B
Weight per 100, Lbs.	....	....
Each, Black	$0.40	.50
Each, Galvanized	$0.60	.75

Size, Inches	1	1 1/4	1 1/2
Class	B	B	B
Weight per 100, Lbs.	....	....	....
Each, Black	$0.60	.80	1.00
Each, Galvanized	$0.90	1.25	1.50

Size, Inches	2	2 1/2	3	4
Class	B	B	B	B
Weight per 100, Lbs.	....	....	....	....
Each, Black	$1.70	2.00	4.00	5.50
Each, Galvanized	$2.50	3.00	6.00	8.25

60° Y BENDS

Size, Inches	2x2	2x1 1/2
Class	B	B
Weight per 100, Lbs.	.....	.....
Each, Black	$1.70	1.70
Each, Galvanized	$2.50	2.50

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

RETURN BENDS CLOSE PATTERN

Fig. 3958

Close pattern return bends will not make up parallel coils, as the distance, center to center of two adjacent bends, is greater than the center to center of openings of a single bend.

Size, Inches	½	¾	1
Class	B	B	B
Center to Center, Inches	1	1¼	1½
R. H. Each, Black	$0.18	.25	.35
R. H. Each, Galvanized	$0.25	.35	.55
R. & L. Each, Black	$0.23	.30	.45
R. & L. Each, Galvanized	$0.35	.40	.65
L. H. Each, Black	$0.23	.30	.45

Size, Inches	1¼	1½	2
Class	C	C	C
Center to Center, Inches	1¾	2 3/16	2 5/8
R. H. Each, Black	$0.50	.75	1.00
R. H. Each, Galvanized	$0.75	1.15	1.65
R. & L. Each, Black	$0.60	.90	1.25
R. & L. Each, Galvanized	$0.85	1.30	1.90
L. H. Each, Black	$0.60	.90	1.25

MEDIUM PATTERN RETURN BENDS

Size, Inches	½	¾	1
Class	B	B	B
Center to Center, Ins.	1¼	1½	1⅞
R.H. Each, Black	$0.18	.25	.35
R.H. Each, Galv.	$0.25	.35	.55
R.& L. Each, Black	$0.23	.30	.45
R.& L. Each, Galv.	$0.35	.40	.65
L.H. Each, Black	$0.23	.30	.45

Fig. 3959

Size, Inches	1¼	1½	2
Class	C	C	C
Center to Center, Inches	2¼	2½	3
R. H. Each, Black	$0.50	.75	1.00
R. H. Each, Galvanized	$0.75	1.15	1.65
R. & L. Each, Black	$0.60	.90	1.25
R. & L. Each, Galvanized	$0.85	1.30	1.90
L .H. Each, Black	$0.60	.90	1.25

RETURN BENDS

Fig. 3960

OPEN

Size, Inches	½	¾	1	1¼
Class	B	B	B	C
Center to Center, Inches	1½	2	2½	3
R. H. Each, Black	$0.20	.30	.50	.65
R. H. Each, Galvanized	$0.28	.45	.70	.90
R. & L. Each, Black	$0.25	.38	.60	.80
R. & L. Each, Galvanized	$	.55	.80	1.05
L. H. Each, Black	$0.25	.38	.60	.80

Size, Inches	1½	2	2½	3
Class	C	C	C	C
Center to Center, Inches	3½	4	4½	5
R. H. Each, Black	$0.85	1.25	2.00	3.00
R. H. Each, Galvanized	$1.25	2.00	3.50	5.00
R. & L. Each, Black	$1.05	1.55	2.50	3.75
R. & L. Each, Galvanized	$1.50	2.40		
L. H. Each, Black	$1.05	1.55	2.50	3.75

MALLEABLE IRON FITTINGS

STANDARD—PLAIN OR BANDED

RETURN BENDS SPECIAL WIDE—RIGHT HAND

Fig. 3961

Size, Inches	⅜	¾
Class	B	B
Center to center, Ins.	1½	4
Each, Black	$0.25	1.00
Each, Galvanized	$0.30	1.35

Size, Inches	¾	1	1¼	1½
Class	B	B	C	C
Center to Center, Inches	6	6	6	6
Each, Black	$1.25	1.25	1.25	2.00
Each, Galvanized	$1.65	1.70	1.70	2.75

Size, Inches	2	3	3	4	6
Class	C	C	C	C	C
Center to Center, Inches	5	7½	8	6	12
Each, Black	$3.00	5.00	5.00	8.00	16.00
Each, Galvanized	$4.00	6.50	6.50		

CROSSOVERS—BANDED

Size, Inches	½	¾	1
Class	B	B	B
Each, Galvanized	$0.25	.40	.60

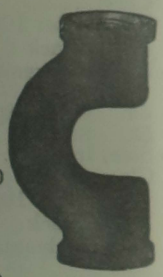


Fig. 3962

CROSSOVER TEES—BANDED

Size, Inches	½	¾	1
Class	B	B	B
Each, Galvanized	$0.50	.70	1.00

REDUCING COUPLINGS

Fig. 3963

Size, Inches	¼	⅜	1
Class	A	B	B
Weight per 100, Lbs.	5½	8½	13½
Each, Black	$0.05	.06	.07
Each, Galvanized	$0.08	.10	.10

Size, Inches	¾	1	1¼	1½
Class	B	B	C	C
Weight per 100, Lbs.	17½	33	52	73
Each, Black	$0.10	.16	.20	.28
Each, Galvanized	$0.15	.25	.35	.45

Size, Inches	2	2½	3	3½	4
Class	C	C	C	C	C
Weight per 100, Lbs.	99	175	250	353	410
Each, Black	$0.45	.70	1.00	1.50	1.85
Each, Galvanized	$0.75	1.05	1.65	2.40	3.05

MALLEABLE IRON COUPLINGS

Size, Inches	¼	⅜	½	¾
Class	B	B	B	B
R.H. Each, Black	$0.03	.05	.07	.10
R. H. Each, Galv.	$0.05	.07	.10	.17
R.& L. Each, Black	$0.04	.06	.08	.12
R.& L. Each, Galv.	$0.06	.09	.10	.17

Fig. 3964

Size, Inches	1	1¼	1½	2	2½	3
Class	C	C	C	C	C	C
R. H. Each, Black	$0.14	.20	.25	.35	.60	.90
R. H. Each, Galvanized	$0.23	.30	.40	.55	.95	1.40
R. & L. Each, Black	$0.16	.25	.36	.52	.70	1.00
R. & L. Each, Galv.	$0.25	.35	.55	.75	1.05	1.50

MALLEABLE IRON FITTINGS

EXTRA HEAVY

For steam working pressure to 250 pounds.

Fig. 3965

ELBOWS

Size, Inches	1/4	3/8	1/2
Each, Black	$0.20	.25	.30

Size, Inches	3/4	1	1 1/4
Each, Black	$0.35	.40	.55

Size, Inches	1 1/2	2	2 1/2
Each, Black	$0.70	.90	1.50

Size, Inches	3	3 1/2	4	5	6
Each, Black	$2.40	3.25	4.25	6.50	9.50

45°

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.25	.30	35	.42

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Black	$0.50	.65	.85	1 10	1.85

Size, Inches	3	3 1/2	4	5	6
Each, Black	$2.85	4.00	5.00	7.50	10.50

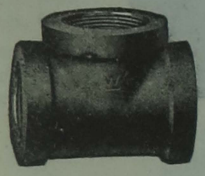


Fig. 3966

Fig. 3967

TEES

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.30	.40	.45	.50

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Black	$0.60	.80	1.05	1.35	2.25

Size, Inches	3	3 1/2	4	5	6
Each, Black	$3.60	5.00	6.50	9.75	14.25

CROSSES

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.60	.80	.90	1.00

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Black	$1.20	1.60	2.10	2.70	4.50

Size, Inches	3	3 1/2	4	5	6
Each, Black	$7.20	10.00	13.00	19.50	28.50

Galvanized fittings take a 50 per cent advance in list price. Stock sizes reducing fittings same price as straight fittings.

HEXAGON SHOULDER NIPPLES

MALLEABLE IRON—STANDARD

Right and Left Hand

Fig. 3968

Size, Inches	1/4	3/8	1/2
Each, Black	$0.20	.20	.20

Size, Inches	3/4	1	1 1/4	1 1/2
Each, Black	$0.25	.30	.40	.50

Size, Inches	2	2 1/2	3	3 1/2	4
Each, Black	$0.70	1.10	1.50	1.90	2.40

Right hand hexagon nipples made to order at special prices.

MALLEABLE IRON FITTINGS

STANDARD BUSHINGS

Fig. 3969

Reducing One Size Only

Size, Inches	1/4	3/8	1/2	3/4
Each, Black	$0.04	.04	.04	.05
Each, Galvanized	$0.08	.08	.08	.10

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Black	$0.06	07	.09	.14	.21
Each, Galvanized	$0.12	.14	.18	.28	.42

FACED BUSHINGS

Fig. 3970

Size, Inches	1/4	3/8	1/2	3/4	1
Each, Black	$0.08	.08	.09	.11	.13
Each, Gal.	$0.12	.12	.14	.17	.20

Size, Inches	1 1/4	1 1/2	2	2 1/2	3
Each, Black	$0.17	.22	.32	.48	.70
Each, Galvanized	$0.25	.33	.48	.72	1.05

Size, Inches	3 1/2	4	4 1/2	5	6
Each, Black	$1.20	1.50	2.10	2.60	3.75
Each, Galvanized	$1.80	2.25	3.15	3.90	5.60

CAPS

Plain or Banded

Fig. 3971

Size, Inches	1/8-1/4	3/8	1/2	3/4
Class	B	B	B	B
Each, Black	$0.03	.04	.05	.08
Each, Galvanized	$0.04	.05	.08	.12

Size, Inches	1	1 1/4	1 1/2	2
Class	B	C	C	C
Each, Black	$0.12	.16	.24	.32
Each, Galvanized	$0.17	.24	.38	.52

Size, Inches	2 1/2	3	3 1/2	4	5	6
Class	C	C	C	C	C	C
Each, Black	$0.45	.85	1.00	1.20	2.50	3.50
Each, Galvanized	$0.76	1.30	1.60	2.00	3.50	5.00

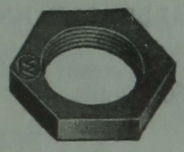


Fig. 3972

LOCK NUTS

Size, Inches	1/8-1/4	3/8	1/2	3/4
Class	B	B	B	B
Each, Black	$0.02	.03	.04	.05
Each, Galvanized	$0.03	.04	.05	.07

Size, Inches	1.	1 1/4	1 1/2	2
Class	B	B	C	C
Each, Black	$0.07	.09	.11	.18
Each, Galvanized	$0.10	.14	.20	.30

FACED LOCK NUTS

Size, Inches	1/4	3/8	1/2	3/4	1
Each, Black	$0.08	.09	.10	.12	.15
Each, Galvanized	$0.11	.13	.15	.18	.22

Size, Inches	1 1/4	1 1/2	2	2 1/2	3
Each, Black	$0.20	.25	.30	.35	.45
Each, Galvanized	$0.30	.35	.45	.50	.65

WASTE NUTS

Fig. 3973

Size, Inches	1/4	3/8	1/2
Class	B	B	B
Each, Black	$0.04	.05	.06
Each, Galvanized	$0.08	.10	.12

Size, Inches	3/4	1	1 1/4	1 1/2
Class	B	B	B	B
Each, Black	$0.08	.10	.15	.25
Each, Galvanized	$0.16	.20	.30	.50

UNION ELBOWS

MALLEABLE IRON

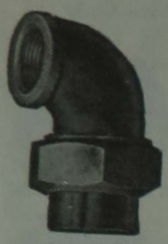


Fig. 3974

For steam working pressure up to 150 pounds.

FEMALE

Size, Inches	¼	⅜
Each, Black	$0.38	.40
Each, Galvanized	$0.57	.60

Size, Inches	½	¾
Each, Black	$0.42	.54
Each, Galvanized	$0.63	.81

Size, Inches	1	1¼	1½	2	2½
Each, Black	$0.63	.90	1.05	1.55	2.85
Each, Galvanized	$0.95	1.35	1.58	2.35	4.30

MALE

Size, Inches	¼	⅜
Each, Black	$0.43	.45
Each, Galvanized	$0.65	.70

Size, Inches	½	¾
Each, Black	$0.48	.62
Each, Galvanized	$0.72	.93

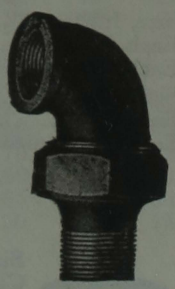


Fig. 3975

Size, Inches	1	1¼	1½	2	2½
Each, Black	$0.72	1.05	1.20	1.80	3.30
Each, Galvanized	$1.08	1.60	1.80	2.70	4.95

Price does not include gaskets.

UNION TEES

MALLEABLE IRON

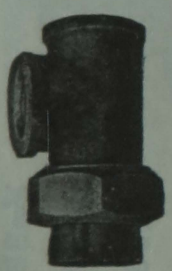


Fig. 3976

For steam working pressures up to 150 pounds.

FEMALE

Size, Inches	¼	⅜
Each, Black	$0.40	.43
Each, Galvanized	$0.60	.65

Size, Inches	½	¾
Each, Black	$0.45	.57
Each, Galvanized	$0.68	.86

Size, Inches	1	1¼	1½	2	2½
Each, Black	$0.70	.95	1.15	1.70	3.20
Each, Galvanized	$1.05	1.45	1.75	2.55	4.80

MALE

Size, Inches	¼	⅜
Each, Black	$0.48	.50
Each, Galvanized	$0.72	.75

Size, Inches	½	¾
Each, Black	$0.52	.65
Each, Galvanized	$0.78	1.00

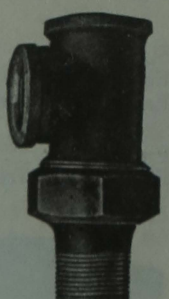


Fig. 3977

Size, Inches	1	1¼	1½	2	2½
Each, Black	$0.80	1.10	1.30	1.95	3.70
Each, Galvanized	$1.20	1.65	1.95	2.95	5.55

Price does not include gaskets.

UNIONS

MALLEABLE IRON STANDARD

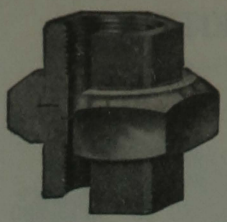


Fig. 3978

For steam working pressures up to 125 pounds.

Size, Inches	⅛	¼
Each, Black	$0.18	.18
Each, Galvanized	$0.27	.27

Size, Inches	⅜	½	¾	1	1¼
Each, Black	$0.20	.22	.27	.33	.46
Each, Galvanized	$0.30	.33	.40	.50	.70

Size, Inches	1½	2	2½	3	3½	4
Each, Black	$0.58	.75	1.55	2.10	3.65	4.35
Each, Galvanized	$0.90	1.15	2.35	3.15	5.50	6.50

Price does not include gaskets.

FLANGE UNIONS

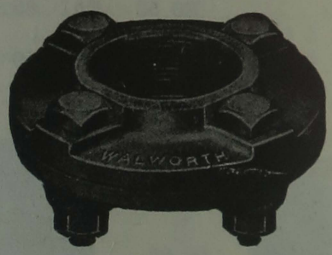


Fig. 3979

CAST IRON

Size, Inches	Diameter of Flanges, Inches	Diameter of Bolt Circle, Inches	Number of Bolts	Each, Black	Each, Galv.
½	2 13/16	1 15/16	3	$0.40	$0.80
¾	3 5/16	2 5/16	3	.46	.92
1	3 9/16	2 9/16	3	.52	1.04
1¼	3 7/8	2 7/8	4	.64	1.28
1½	4 3/8	3 1/4	4	.78	1.56
2	5	3 3/4	4	1.00	2.00
2½	6 1/16	4 1/2	4	1.25	2.50
3	6 11/16	5 1/8	4	1.50	3.00
3½	7 3/16	5 5/8	4	1.80	3.60
4	7 3/4	6 3/16	5	2.10	4.20
4½	8 7/16	6 13/16	5	2.70	5.40
5	8 15/16	7 5/16	5	3.15	6.30
6	10 1/8	8 1/2	6	3.95	7.90
7	11 1/8	9 1/2	7	5.50	11.00
8	12 5/16	10 11/16	8	7.00	14.00
9	13 3/4	11 7/8	8	10.00	20.00
10	14 7/8	13	10	11.50	23.00
12	17	15 1/8	12	16.00	32.00

MALLEABLE

Size, Inches	Diameter of Flanges, Inches	Diameter of Bolt Circle, Inches	Number of Bolts	Each, Black	Each, Galv.
¾	2 7/8	2 1/16	3	$1.40	$2.80
1	3 1/4	2 5/16	4	1.60	3.20
1¼	3 3/4	2 13/16	4	2.00	4.00
1½	4 5/8	3 3/8	4	2.50	5.00
2	5 1/2	4 1/8	4	3.00	6.00
2½	6	4 9/16	4	3.50	7.00
3	6 3/4	5 3/8	4	4.40	8.80
3½	7 1/2	6 1/8	4	5.25	10.50
4	8	6 11/16	5	6.00	12.00
4½	8 5/8	7	5	7.00	14.00
5	9 3/8	7 3/4	5	8.00	16.00
6	10 5/8	8 7/8	6	9.00	18.00
8	13 1/8	.....	7	18.00	36.00

Above flange unions are furnished faced and without gaskets.

UNIONS

DART

Have two bronze seats which prevent corrosion; malleable iron pipe ends and nut insure strength and durability. These two points are essential to make perfect and lasting joints.

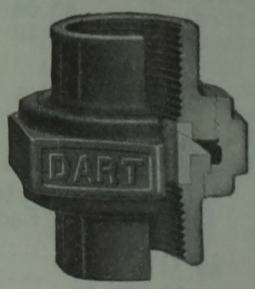


Fig. 3980

FEMALE UNIONS

Size, Inches	1/8	1/4	3/8	1/2
Each, Black	$0.30	.30	.40	.50
Each, Galvanized	$0.45	.45	.60	.75

Size, Inches	3/4	1	1 1/4	1 1/2
Each, Black	$0.60	.80	1.20	1.60
Each, Galvanized	$0.90	1.20	1.80	2.40

Size, Inches	2	2 1/2	3	3 1/2	4
Each, Black	$2.00	3.20	4.80	7.20	10.80
Each, Galvanized	$3.00	4.80	7.20	10.80	16.20

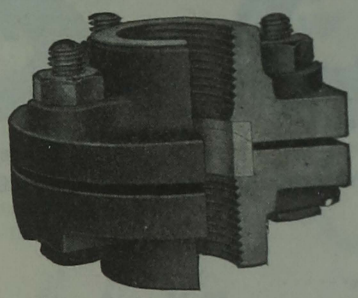


Fig. 3981

CAST IRON FLANGE UNIONS

Size, Inches	1/2	3/4	1	1 1/4	1 1/2	2
Each, Black	$0.55	.60	.80	1.20	1.60	2.00

Size, Inches	2 1/2	3	3 1/2	4	4 1/2	5
Each, Black	$3.20	4.80	6.00	7.50	8.75	10.00

Size, Inches	6	7	8	9	10	12
Each, Black	$12.50	15.00	18.00	21.60	28.80	46.00

Ten per cent advance for malleable iron flanges.

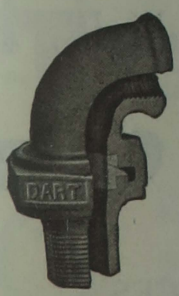


Fig. 3982

UNION ELBOWS

Female, and Male and Female

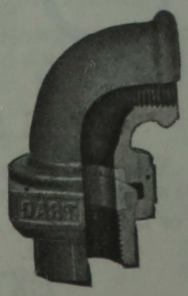


Fig. 3983

Size, Inches	1/4	3/8	1/2	3/4
Each, Plain	$0.45	.60	.75	.90

Size, Inches	1	1 1/4	1 1/2	2	2 1/2
Each, Plain	$1.20	1.80	2.40	3.00	4.80

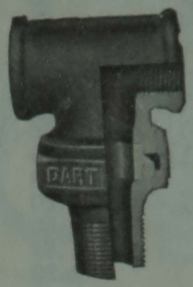


Fig. 3984
Male

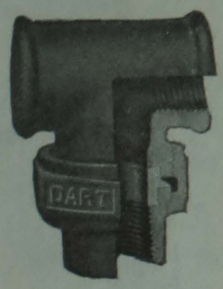


Fig. 3985
Female

TEE UNIONS ON THE OUTLET

Size, Inches	1/4	3/8	1/2	3/4
Each, Plain	$0.50	.66	.82	.99

Size, Inches	1	1 1/4	1 1/2	2
Each, Plain	$1.32	1.98	2.64	3.30

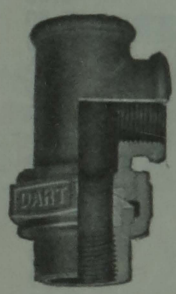


Fig. 3986
Female

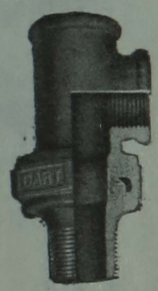


Fig. 3987
Male

TEE UNIONS ON THE RUN

Size, Inches	1/4	3/8	1/2	3/4
Each, Plain	$0.50	.66	.82	.99

Size, Inches	1	1 1/4	1 1/2	2
Each, Plain	$1.32	1.98	2.64	3.30

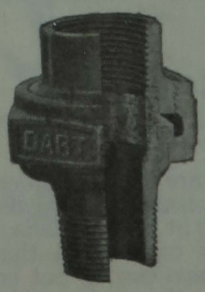


Fig. 3988

MALE AND FEMALE UNIONS

Size, Inches	1/4	3/8
Each, Plain	$0.38	.50

Size, Inches	1/2	3/4
Each, Plain	$0.62	.75

Size, Inches	1	1 1/4	1 1/2
Each, Plain	$1.00	1.50	2.00

Size, Inches	2	2 1/2	3
Each, Plain	$2.50	4.00	6.00

AIR PUMP UNIONS

Size, Inches	3/4x1	1x1 1/4
Each, Plain	$0.90	1.20

Size, Inches	1 1/4x1 1/2	1 1/2x2
Each, Plain	$1.80	2.40

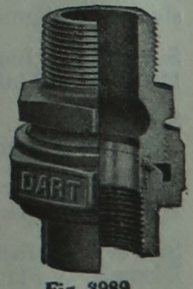


Fig. 3989

Galvanized Unions not listed take a 30 per cent advance in list prices.

COMMON FLANGES

CAST IRON—NOT FACED

Fig. 3990

Size, Inches	Each	Size, Inches	Each
⅝x 3	$0.16	5 x10	$1.50
½x 3½	.20	5 x11	1.75
¾x 3½	.20	5x12	2.20
¾x 4	.22	5x12½	2.20
¾x 5	.30	6x10	1.50
1 x 5	.30	6x11	1.75
1 x 6	.42	6x12	2.20
1¼x 4½	.25	6x12½	2.20
1¼x 5	.30	6x13	2.80
1¼x 6	.40	6x13½	2.80
1½x 5	.30	6x14	3.25
1½x 6	.40	7x12	2.20
2 x 6	.42	7x12½	2.20
2 x 6½	.50	7x13	2.80
2 x 7	.62	7x13½	2.80
2 x 8	.90	7x14	3.25
2½x 6	.42	7x15	4.00
2½x 6½	.50	8x13	2.80
2½x 7	.62	8x13½	2.80
2½x 8	.90	8x14	3.25
3 x 6½	.50	8x15	4.00
3 x 7	.62	8x16	5.00
3 x 7½	.75	9x15	4.00
3 x 8	.90	9x16	5.00
3 x 9	1.15	9x17	5.75
3½x 8	.90	10x16	5.00
3½x 8½	1.00	10x17	5.75
3½x 9	1.15	10x18	7.00
3½x10	1.50	10x19	7.50
4 x 8	.90	12x18	7.00
4 x 8½	1.00	12x19	7.50
4 x 9	1.15	12x20	8.50
4 x10	1.50	14x20	8.50
4½x 9	1.15	14x21	9.50
4½x 9¼	1.25	15x21	9.50
4½x10	1.50	15x22¼	14.00
4½x11	1.75	16x23½	18.00

Size 14 inch and larger are to be used with O. D. pipe of same sizes. The above is considered a complete list; other sizes made to order.

CIRCULAR FLANGES

CAST IRON

Fig. 3991

These flanges are made to order. It is always necessary to give the circle they are to fit when ordering. Patterns are so constructed that the bosses for pipe can be put on any size flange shown in table, thereby increasing the variety of sizes and diameters to meet circumstances.

Size of Pipe, Inches	1½	2	2½
Diameter of Flange, Inches	6	7	8
Size, Inches	3	4	5
Diameter of Flange, Inches	9	9	11
Size of Pipe, Inches	6	7	8
Diameter of Flange, Inches	12	13	14
Size of Pipe, Inches	9	10	12
Diameter of Flange, Inches	17	18	20

Prices on Application

FLOOR FLANGES

CAST IRON

Fig. 3992

Size of Pipe, Inches

Diam., Inches	¼ Each	⅜ Each	½ Each
2½	$0.08	$0.09	$0.09
3	.10	.11	.11
3½	...	.14	.13
4	...	.17	.17
4½	...	...	.19
5	...	...	.22

Size of Pipe, Inches

Diameter Inches	¾ Each	1 Each	1¼ Each	1½ Each	2 Each	2½ Each
2½	$0.10	.....	.....	.....	.....	.....
3	.13	$0.13	.....	.....	.....	.....
3½	.15	.16	$0.19	.....	.....	.....
4	.18	.19	.21	$0.22	.....	.....
4½	.20	.22	.24	.26	.....	.....
5	.28	.29	.31	.34	$0.38	.....
5½	.....	.32	.34	.39	.39	.....
6	.....	.35	.42	.48	.51	.....
6½	.....	.....	.47	.57	.61	$0.62

For Galvanized Flanges Double the Lists.

FLOOR AND CEILING PLATES

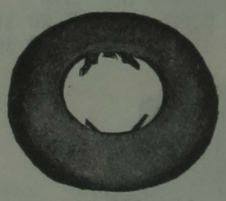


Fig. 3993

NO. 1 Adjustable

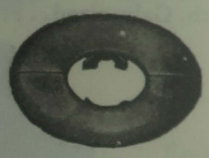


Fig. 3994

NO. 10 Hinged

COLD ROLLED STEEL

NO. 1 and NO. 10.

Size, Inches	⅜	½	¾	1	1¼	1½
Each, Black	$0.15	.16	.17	.20	.22	.25
Each, Nickeled	$0.26	.27	.28	.32	.35	.38

Size, Inches	2	2½	3	3½	4
Each, Black	$0.30	.50	.65	.80	1.00
Each, Nickeled	$0.45	.65	.80	1.00	1.25

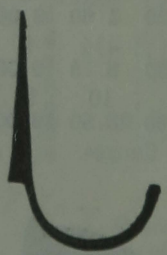


Fig. 3995

PIPE HOOKS

Size, Inches	¼	⅜
Per 100	$0.45	.55

Size, Inches	½	¾	1
Per 100	$0.65	.80	1.00

Size Inches	1¼	1½	2
Per 100	$1.30	1.60	2.00

PIPE STRAPS

Tinned pipe straps can be furnished in sizes from ¼ to 2 inches.

Per Lb. $0.30

Fig. 3996

EXTENSION PIECES

Fig. 3997

MALLEABLE IRON

Size, Inches	⅜	½	¾
Class	B	B	B
Each, Black	$0.06	.09	.12
Each, Galvanized	$0.09	.13	.18

PIPE HANGERS

BALL JOINT

Fig. 3998

NO. 1—WITH LAG SCREW

The lag screws for No. 1 are cut, and the balls tapped to correspond with sizes of wrought iron pipe; ½ to 2-inch hangers, ⅛ inch pipe; 2 and 2½ inch hangers, ¼ inch pipe; 3, 3½ and 4 inch hangers, ⅜ inch pipe; 5 to 8-inch hangers, ½ inch pipe; and 10 and 12-inch hangers, ¾-inch pipe. Can be lengthened to any required distance with a coupling and nipple.

PLAIN

Size, Inches	½	¾	1	1¼
Each	$0.15	.18	.18	.20
Size, Inches	1½	2	2½	3	3½	4
Each	$0.22	.25	.30	.35	.50	.60
Size, Inches	5	6	7	8	10	12
Each	$0.70	.90	1.20	1.40	1.80	2.10

NO. 2—WITH I-BEAM CLAMP—PLAIN

The nipples for No. 2 hangers are not furnished but are the same sizes for the various hangers as given for the lag screws on No. 1 hangers. State size of iron beam wanted when ordering. For clamps for beams over 6 inches an additional charge will be made.

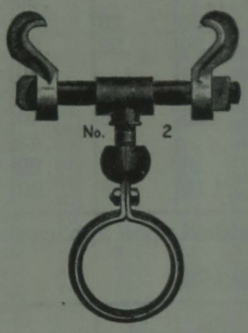


Fig. 3999

PLAIN

Size, Inches	½	¾	1	1¼	1½
Each	$0.55	.58	.58	.60	.62
Size, Inches	2	2½	3	3½	4
Each	$0.65	.70	.75	.80	1.00
Size, Inches	5	6	7	8	10	12
Each	$1.10	1.30	1.60	1.80	2.20	2.50

Fig. 4000

NO. 3—WITH SCREW PLATE

The nipples for No. 3 hangers are furnished 5 inches long, and are of the same size as lag screws on No. 1 hangers.

PLAIN

Size, Inches	½	¼	1
Each	$0.30	.33	.33
Size, Inches	1¼	1½	2
Each	$0.35	.37	.40

Size, Inches	2½	3	3½	1	5
Each	$0.55	.62	.83	.98	1.17
Size, Inches	6	7	8	10	12
Each	$1.40	1.70	1.90	2.20	2.50

PIPE HANGERS

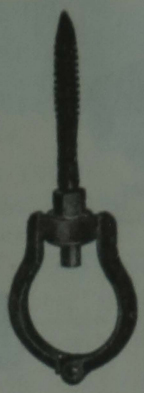


Fig. 4001

Lag screw-ends have iron pipe thread, and hangers can be lengthened any required distance with a coupling and nipple.

Size, Inches	⅜	½	¾
Lag Screws, Inches	⅛	⅛	⅛
Price, Each	$0.15	.15	.18
Size, Inches	1	1¼	1½
Lag Screws, Inches	⅛	¼	¼
Price, Each	$0.18	.20	.22
Size, Inches	2	2½	3
Lag Screws, Inches	¼	¼	¼
Price, Each	$0.25	.30	.35

Size, Inches	3½	4	4½	5
Lag Screws, Inches	⅜	⅜	⅜	½
Price, Each	$0.50	.60	.65	.70
Size, Inches	6	7	8	10
Lag Screws, Inches	½	½	½	½
Price, Each	$0.90	1.20	1.40	1.80

ADJUSTABLE BEAM CLAMPS

ACME MALLEABLE IRON

This clamp is adjustable to beams from 2½ to 7 inches. Hole is not threaded and is large enough for ⅜-inch pipe. Price each . . . $0.50

Fig. 4002

HOOK PLATES

CAST IRON

Fig. 4003

Fig. 4004

No. of Hooks	Distance Between Centers, Inches			
	2½ 1 Inch Pipe, Each	3 1¼ Inch Pipe, Each	3½ 1½ Inch Pipe, Each	4½ 2 Inch Pipe, Each
1	$0.90	$0.10	$0.15	$0.22
2	.18	.21	.28	.43
3	.23	.27	.43	.65
4	.26	.32	.58	.90
5	.32	.41	.72	1.15
6	.38	.52	.88	1.35

PIPE SADDLES

Fig. 4005

Number of Hooks	3	4	5	6
Each, 1 Inch	$0.60	.65	.70	.90
Each, 1¼ Inch	$0.65	.75	.85	1.10
Number of Hooks	7	8	9	10
Each, 1 Inch	$1.00	1.40	1.60	1.75
Each, 1¼ Inch	$1.40	1.65	1.80	2.00

RAILING FITTINGS

PIPE SIZES

Fig. 4006
Elbow

Fig. 4007
45° Elbow

Fig. 4008
Tee-Side Outlet

Fig. 4009
Floor Flange

Fig. 4010
45° Tee

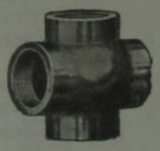


Fig. 4011
Cross

Fig. 4012
45° Cross

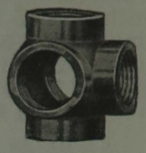


Fig. 4013
Cross-Side Outlet

Fig. 4014
Ornament

FOR FENCES, ENCLOSING ENGINES AND MACHINERY, EXHIBITION SPACES, ETC.

MALLEABLE IRON

Size, Inches	½	¾	1	1¼	1½	2	2½	3
Elbows, Each, Black	$0.15	$0.18	$0.20	$0.35	$0.45	$0.72	$1.60	$2.25
Elbows, Side Outlet, Each, Black	.20	.23	.25	.40	.50	.80	1.75	2.50
45° Elbows	....	....	.30	.45	.55	.90	2.15	2.90
Tees, Each, Black	.20	.23	.25	.40	.50	.75	1.75	2.50
Tees, Side Outlet, Each, Black	.30	.33	.35	.45	.55	.90	1.90	2.60
45° Tees	....	....	.40	.50	.60	.95	2.50	3.00
Crosses, Each, Black	.30	.33	.35	.45	.58	1.00	1.80	2.60
Crosses, Side Outlet, Each, Black	.35	.38	.40	.50	.65	1.35	2.00	2.75
45° Crosses	....	....	.43	.55	.70	1.15	2.20	2.75
Floor Flanges, Each, Black	.16	.18	.20	.40	.50	.90	1.35	2.50
Acorn Ornaments, Each, Black	.16	.18	.20	.25	.35	.90	1.35	2.00

Galvanized, double list. Prices for reducing sizes furnished upon application.

FINISHED BRASS

Size, Inches	½	¾	1	1¼	1½	2	2½	3
Elbows, Each	$0.40	$0 60	$0.80	$0.20	$1.60	$2.50	$4.00	$7.00
Elbows, Side Outlet, Each	.75	1.00	1.45	1.70	2.00	3.00	6.00	8.50
45° Elbows	....	....	1.50	1.70	2.15	3.00	....	....
Tees, Each	.60	.85	1.10	1.70	2.00	3.00	6.00	8.50
Tees, Side Outlet, Each	1.05	1.25	1.50	2.00	2.40	3.50	7.00	10.00
45° Tees	....	....	1.55	2.05	2.40	3.35	....	....
Crosses, Each	1.05	1.25	1.50	2.00	2.40	3.50	7.00	10.00
Crosses, Side Outlet, Each	1.20	1.45	1.70	2.25	3.00	4.00	8.00	11.50
45° Crosses	....	....	1.60	2.20	2.60	3.40	....	....
Floor Flanges, Each	.75	.90	1.00	1.35	1.75	2.50	5.00	7.00
Acorn Ornaments, Each	.75	.90	1.00	1.35	1.75	2.50	5.00	7.00

In ordering these railing fittings, be careful to state whether right-hand or left-hand threads are wanted. Where fittings are required having right and left-hand outlets, please describe which are wanted right-hand and which left-hand. A careful observance of the above will save much trouble and secure the accurate filling of your orders.

For right and left and left-hand threads, add 25 per cent to list prices.

GENERAL DIMENSIONS

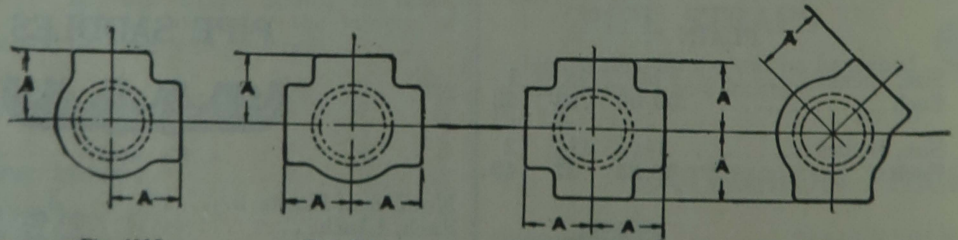


Fig. 4015 Fig. 4016 Fig. 4017 Fig. 4018

Size, Inches	½	¾	1	1¼	1½	2	2½	3
A, Inches	1	1⅛	1 7/16	1¾	1 15/16	2¼	2 11/16	3⅛

SEAMLESS BRASS, COPPER AND BRONZE TUBING

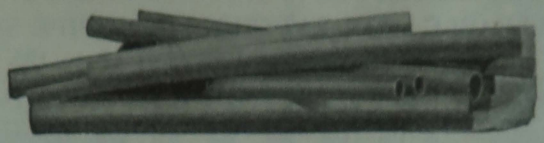


Fig. 4019

NET EXTRAS IN CENTS PER POUND OVER BASE PRICES

Adopted September 15, 1917

These prices are for 100 pounds or over per item in one order

Wall Thicknesses — Stubs Gauge	Decimal Inch	Outside Diameter: 3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	3 3/4	4
No. 6 & Heav.	.203	....	....	....	....	....	....	....	....	$0.02											
7	.180	....	....	....	....	....	....	$0.08	$0.05	.01					BASE PRICE						
8	.165	....	....	....	....	....	$0.08	.06	.04												
9	.148	....	....	....	....	....	.07	.05	.03											$.01	$.01
10	.134	....	....	....	....	....	.06	.04	.03											.02	.02
11	.120	....	....	$0.11	$0.09	$0.07	.05	.04	.03								$.01	$.01	$.01	.02	.03
12	.109	....	....	.10	.08	.06	.05	.04	.03								.01	.01	.02	.03	.04
13 or 3/32	.095	....	....	.09	.08	.06	.05	.04	.03				$.01	$.01	$.01	$.01	.01	.01	.02	.03	.04
14	.083	$0.10	$0.09	.08	.07	.06	.05	.04	.03	.02	$0.02	$.02	.02	.02	.02	.02	.02	.02	.03	.04	.05
15	.072	.10	.09	.08	.07	.06	.05	.04	.03	.03	.03	.03	.03	.03	.04	.04	.04	.04	.05	.06	.07
16 or 1/16	.065	.11	.10	.09	.08	.07	.06	.05	.04	.03	.03	.03	.04	.04	.05	.05	.05	.05	.06	.07	.08
17	.058	.12	.11	.10	.09	.08	.07	.06	.05	.05	.05	.05	.06	.06	.07	.07	.07	.07	.08	.09	.11
18	.049	.13	.12	.11	.10	.09	.08	.07	.07	.07	.07	.07	.08	.08	.08	.08	.09	.09	.10	.12	.14
19	.042	.14	.13	.12	.11	.10	.09	.08	.08	.08	.08	.08	.09	.09	.10	.10	.11	.11	.13	.15	.17
20	.035	.18	.16	.14	.13	.12	.11	.10	.10	.10	.10	.11	.12	.12	.13	.13	.14	.15	.17	.20	.23
21 or 1/32	.032	.20	.18	.16	.15	.14	.13	.12	.12	.12	.13	.14	.15	.15	....	....	....	....	....	....	....
22	.028	.22	.20	.18	.17	.16	.15	.14	.14	.15	.16	.17	.18	.19	....	....	....	....	....	....	....
23	.025	.25	.23	.20	.19	.18	.17	.16	.16	.18	.19	.22	.25	.28	....	....	....	....	....	....	....

Stubs Gauge	Decimal Inch	4 1/4	4 1/2	4 3/4	5	5 1/4	5 1/2	5 3/4	6	6 1/4	6 1/2	6 3/4	7	7 1/4	7 1/2	7 3/4	8	8 1/2	9	9 1/2	10
No. 6 & Heav.	.203	BA	SE	$0.02	$0.04	$0.04	$0.06	$0.06	$0.07	$0.07	$0.07	$.07	$.08	$.09	$.09	$.09	$.11	$.11	$.11	$.15	$.18
7	.180	PR	ICE	.02	.04	.04	.06	.06	.07	.07	.07	.07	.08	.09	.09	.09	.11	.11	.11	.15	.18
8	.165			.02	.04	.04	.06	.06	.07	.07	.07	.07	.08	.09	.09	.09	.11	.11	.11	.15	.18
9	.148	$0.01	$0.01	.02	.04	.04	.06	.06	.07	.07	.07	.07	.08	.09	.09	.09	.11	.11	.11	.15	.18
10	.134	.01	.02	.02	.04	.04	.06	.06	.07	.07	.07	.07	.08	.09	.09	.09	.11	.11	.11	.15	.18
11	.120	.02	.03	.03	.05	.05	.06	.06	.07	.07	.07	.07	.08	.09	.09	.09	.11	.11	.11	.15	.18
12	.109	.03	.04	.04	.06	.06	.07	.07	.08	.08	.08	.09	.09	.11	.11	.11	.12	.12	.14	.16	.19
13 or 3/32	.095	.04	.05	.05	.07	.07	.08	.08	.09	.09	.10	.11	.11	.12	.12	.12	.14	.14	.15	.18	.21
14	.083	.05	.06	.06	.08	.08	.09	.09	.11	.11	.11	.11	.13	.13	.13	.15	.15	.15	.16	....	....
15	.072	.07	.08	.08	.10	.10	.11	.11	.13	.13	.15	.17	.17	.20	.20	.20	....	....	....	....	....
16 or 1/16	.065	.08	.10	.12	.14	.14	.16	.17	.19	.20	.22	.24	.24	.27	.27	.27	....	....	....	....	....
17	.058	.12	.14	.16	.18	.20	.22	.24	.26	.29	.31	.33	.33	.36	.36	.38	....	....	....	....	....
18	.049	.16	.18	.20	.23	.26	.29	.32	.35	.38	.41	.44	.46	....	....	....	....	....	....	....	....
19	.042	.20	.23	.26	.29	.33	.37	.41	.45	....	....	....	....	....	....	....	....	....	....	....	....
20	.035	.26	.29	.32	.35	.40	.45	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Sizes between Gauges or Diameters take price of nearest Gauge or Diameter. For all Seamless Tubes of any shape other than Round, special prices quoted upon application.

IRON PIPE SIZES. EXTRAS OVER BASE PRICES

Length, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6	7	8
Per Pound	$0.10	.07	.04	.02	BASE PRICE									.03	.06	.07	.09	.11

Special Plumbers' Sizes, other than Iron Pipe Sizes listed above, priced as per regular Seamless Tube List for corresponding size and gauge.

ADDITIONAL CHARGE FOR CUTTING SEAMLESS TUBES TO EXACT LENGTHS, 24 INCHES OR LESS

Length, Inches	Over 12 in. to 24 in. inc.	Over 9 in. to 12 in. inc.	Over 6 in. to 9 in. inc.	Over 4 in. to 6 in. inc.	Over 2 in. to 4 in. inc.	Over 1 in. to 2 in. inc.	Over 3/4 in. to 1 in. inc.
Per Pound	$0.01	.01 1/2	.02	.03	.04	.06	.08

No additional charge for cutting Tubes to exact lengths if required over 2 feet to 20 feet inclusive. Longer than 20 feet, 1 cent per pound extra.

BRASS NIPPLES

Iron Pipe Size Inches	Length Close, Inches	Price, Each—Length Inches: Close	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6
1/8	3/4	$0.11	$0.13	$0.15	$0.17	$0.19	$0.21	$0.23	$0.25	$0.27	$0.29	$0.31
1/4	7/8	.13	.16	.19	.22	.25	.28	.31	.34	.37	.40	.43
3/8	1	.15	.19	.23	.27	.31	.35	.39	.43	.47	.51	.55
1/2	1 1/8	.23	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70
3/4	1 5/8	.28	....	.35	.42	.49	.56	.63	.70	.77	.84	.91
1	1 1/2	.37	....	.44	.53	.62	.71	.80	.89	.98	1.07	1.16
1 1/4	1 5/8	.60	....	....	.75	.88	1.01	1.14	1.27	1.40	1.53	1.66
1 1/2	1 3/4	.70	....	....	.90	1.05	1.20	1.35	1.30	1.65	1.80	1.95
2	2	1.00	....	....	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60
2 1/2	2 1/2	1.70	....	....	....	2.00	2.30	2.60	2.90	3.20	3.50	3.80
3	2 5/8	2.50	....	....	....	2.90	3.30	3.70	4.10	4.50	4.90	5.30
3 1/2	2 3/4	4.00	....	....	....	....	....	5.40	6.00	6.60	7.20	7.80
4	2 7/8	4.75	....	....	....	....	....	6.15	6.85	7.55	8.25	8.95

Lengths of Close Nipples conform to manufactured standard.

BRASS FITTINGS

MALLEABLE IRON PATTERN—IRON PIPE SIZES—ROUGH

For Steam Working Pressures up to 125 Pounds.

Fig. 4020
Tee

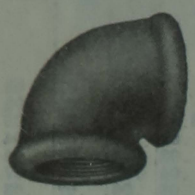


Fig. 4021
Elbow

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, Each	$.12	.15	.20	.28	.40	.63	.90	$1.20	$2.00	$3.50	$6.00	$8.00	10.00
Elbows, Side Outlet, Each	....	....	.60	.85	1.20	1.90	2.75	3.60	6.00	10.50	18.00	....	....
Elbows, Reducing, Each	.19	.25	.25	.35	.50	.80	1.10	1.50	2.50	4.25	7.50	10.00	12.50
Elbows, 45°, Each	.16	.20	.25	.31	.40	.63	.85	1.50	2.00	3.50	6.00	....	....
Elbows, Street, Each	.25	.27	.33	.48	.63	.85	1.50	2.00	3.25	....	....	....	....
Elbows, Drop, Female, Each	....	....	.35	.45	.65	1.05	1.50	....	....	....	....	....	....
Tees, Each	.17	.21	.28	.40	.55	.85	1.25	1.70	2.80	.500	6.50	11.00	14.00
Tees, Reducing, Each	....	.25	.35	.50	.70	1.05	1.80	2.10	3.50	6.25	10.30	14.00	17.50
Tees, Drop, Female, Each	....	....	.42	....	.80	1.25	1.80	....	....	....	....	....	....
Crosses, Each	.25	.30	.40	.55	.80	1.25	1.80	2.00	4.00	7.00	12.00	16.00	20.00
Crosses, Reducing, Each	....	.38	.50	.70	1.00	1.55	2.25	3.00	5.00	8.75	15.00	20.00	25.00
Return Bends, Open, Each	....	....	....	.80	1.10	1.40	2.15	3.00	4.35	8.25	11.00	....	....
Return Bends, Close, Each	....	....	....	.70	1.00	1.25	1.80	2.50	4.25	....	....	....	....
Couplings, Each	.10	.13	.17	.25	.37	.55	.80	1.00	1.60	2.50	3.50	5.25	7.00
E. V. Bends, Each	....	....	....	.75	1.10	1.65	2.50	3.30	5.50	9.50	16.00	....	26.00
Reducers, Each	....	.15	.20	.28	.40	.60	.90	1.10	1.35	2.75	4.00	6.00	8.00
Caps, Each	.10	.13	.16	.20	.30	.42	.60	.80	1.25	2.50	3.50	5.50	7.00
Plugs, Each	.08	.10	.12	.15	.20	.30	.45	.60	.95	1.50	2.25	3.75	5.00
Locknuts, Each	.10	.10	.12	.15	.20	.28	.40	.55	.80	1.25	2.75	4.00	5.00
Bushings, Each	....	.10	.12	.15	.22	.35	.50	.70	1.00	1.50	2.50	3.75	5.00

FINISHED

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, Each	$.30	.30	.45	.56	.75	1.10	1.55	2.00	3.00	5.50	9.00	14.00	17.50
Elbows, Side Outlet, Each	....	....	1.35	1.70	2.25	3.30	4.70	6.00	9.00	16.50	27.00	....	....
Elbows, Reducing, Each	....	.44	.55	.70	.95	1.40	1.90	2.50	3.75	6.75	11.25	17.50	22.00
Elbows, 45°, Each	.38	.45	.55	.66	.85	1.23	1.70	2.20	3.25	6.00	9.75	....	19.50
Elbows, Street, Each	.47	.52	.63	.83	1.08	1.45	2.30	3.00	4.50	....	....	....	....
Elbows, Drop, Female, Each	....	....	.85	1.05	1.40	2.00	2.80	3.60	5.40	....	....	....	....
Tees, Each	.42	.49	.63	.80	1.05	1.50	2.15	2.80	4.20	7.75	12.75	19.50	24.50
Tees, Reducing, Each	....	.60	.77	1.00	1.30	1.85	2.65	3.50	5.25	9.75	15.80	24.50	30.50
Tees, Drop, Female, Each	....	....	1.13	1.37	1.80	2.55	....	....	....	....	....	....	....
Crosses, Each	.60	.70	.90	1.10	1.50	2.20	3.10	4.00	6.00	11.00	18.00	28.00	35.00
Crosses, Reducing, Each	....	.88	1.10	1.40	1.85	2.75	3.85	5.00	7.50	13.75	22.50	35.00	41.00
Return Bends, Open, Each	....	....	....	1.65	2.15	2.80	4.10	5.40	7.75	14.25	20.00	....	....
Return Bends, Close, Each	....	....	....	1.55	2.05	2.65	3.75	4.90	7.25	....	....	....	....
Couplings, Each	.24	.28	.36	.46	.63	.90	1.30	1.60	2.35	4.00	5.75	9.75	12.50
Y Bends, Each	....	....	....	1.60	2.15	3.05	4.45	5.70	8.50	15.50	25.00	....	41.00
Reducers, Each	....	.35	.45	.56	.75	1.05	1.55	1.90	2.75	4.75	7.00	12.00	15.50
Caps, Each	.20	.25	.31	.40	.55	.77	1.10	1.50	2.25	4.00	5.50	8.00	10.00
Plugs, Each	.23	.30	.37	.43	.55	.75	1.00	1.30	1.95	3.00	4.25	6.25	8.00
Locknuts, Each	.24	.25	.32	.40	.50	.65	.85	1.10	1.60	3.25	4.75	6.50	8.00
Bushings, Each	....	.22	.27	.35	.47	.70	1.00	1.40	2.00	3.00	4.50	6.25	8.00

Fig. 4022
Tee

Fig. 4023
Elbow

Finished fittings can also be furnished nickel-plated. Prices on Application.

Fig. 4024
Tee

EXTRA HEAVY—ROUGH—CAST IRON PATTERN

For Steam Working Pressures to 250 Pounds

Fig. 4025
Elbow

Size, Inches	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4
Elbows, Each	$.33	.45	.65	1.00	1.50	2.25	3.00	4.50	8.00	11.25	16.00	22.00
Elbows, Reducing, Each	....	.55	.75	1.20	1.80	2.60	3.50	5.25	9.00	13.00	19.00	25.00
Elbows, 45°, Each	....	.55	.75	1.10	1.65	2.50	3.25	4.50	8.00	11.25	16.00	22.00
Tees, Each	.45	.60	.90	1.35	2.00	3.00	4.00	6.00	10.75	15.00	22.00	30.00
Tees, Reducing, Each	....	.70	1.05	1.55	2.30	3.50	4.50	6.75	12.00	17.00	25.00	35.00
Crosses, Each	....	....	1.30	2.00	3.00	4.50	6.00	9.00	16.00	22.50	28.00	37.00
Crosses, Reducing, Each	....	....	1.50	2.40	3.60	5.25	7.00	10.50	18.00	26.00	32.00	42.00
Return Bends, Close, Each	....	....	1.65	2.50	3.50	5.00	7.00	10.00	16.00	22.00	....	40.00
Return Bends, Open, Each	....	....	....	2.75	4.00	5.50	8.00	11.00	18.00	25.00	....	45.00
Couplings, Each	.40	.50	.70	1.10	1.65	2.25	3.00	4.50	7.00	10.00	13.00	17.00
Y Bends, Each	....	....	1.50	2.50	3.50	5.50	7.25	11.00	19.00	27.00	33.00	45.00

Can also be furnished "finished." Prices on application.

BRASS UNIONS—GROUND JOINT

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2
Rough, Each	$.50	.50	.65	.85	1.15	1.60	2.25	2.70	4.00	7.50	11.50	....
Semi-Finished, Each	.45	.55	.75	.75	1.30	1.75	2.50	3.00	4.50	8.25	12.75	22.50
Finished, Each	.50	.60	.85	1.05	1.40	1.50	2.75	2.25	5.00	9.00	14.00	25.00
Extra Heavy, Rough, Each	....	1.10	1.40	1.60	1.85	2.00	4.00	5.25	7.50	10.00	15.00	....

Fig. 4026

Extra heavy unions will stand 250 pounds steam working pressure, others 125 to 200 pounds.

STEAM JOINT CLAMPS

SKINNER

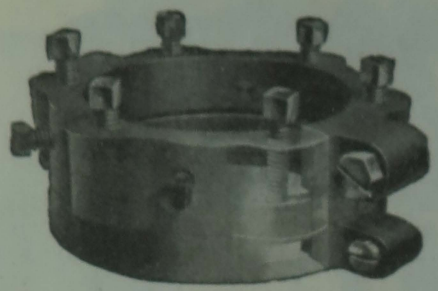


Fig. 4027

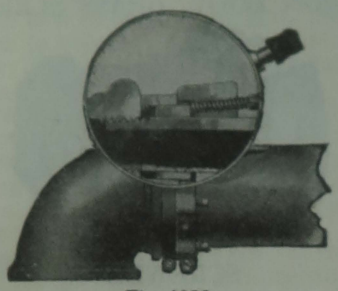


Fig. 4028

Made of malleable iron, painted and equipped with Tobin bronze thrust screws.

For permanently repairing leaks at joints where pipe is screwed into fitting. Operates on the same principle as a gland and stuffing box. Applied with a small wrench it will hold any joint. The entire thrust of the clamp is made against the packing through the intermediate ring.

The lip on the gasket container ring serves the double purpose of preventing the packing from escaping between clamp and fitting and of guiding the packing downwards into the threads. Clamps can be repacked without disturbing the main ring. Takes up about 2½ inches on pipe. Can be applied by anyone. Clamps ½ to 12 inches are for pipe inside diameter as shown, 14 inches and larger for pipe outside diameter.

Size, Inches	Weight Each, Lbs.	Each
½	1½	$1.50
¾	1½	1.50
1	1½	1.50
1¼	1¾	1.90
1½	2	2.25
2	2¼	3.00
2½	2½	3.75
3	4½	4.50
3½	4¾	5.25
4	5½	6.00
4½	6	6.75
5	6½	7.50
6	8¾	9.00
7	11	10.50
8	14	13.00
9	15½	15.75
10	18	18.75
12	28	22.50
14	38	31.50
15	43	33.75
16	46	36.00
18	58	40.50
20	67	45.00
21	71	50.00
22	80	55.00
24	93	60.00
26	101	65.00

One in a Box

EMERGENCY PIPE CLAMPS

MALLEABLE IRON

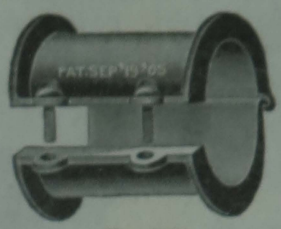


Fig. 4029

Makes a permanent repair of a leak in a pipe. Its use effects a great saving, since it eliminates the necessity of renewing a length of pipe or shutting off the pressure during the repair. Consists of a malleable iron cylinder divided into halves which are hinged along one side and fitted with tightening bolts on the other side. Easy to apply; simply place a strip of packing over leak, apply and tighten the clamp.

Size Pipe, Inches	Length Over All, Inches	Weight per Dozen, Lbs.	Each
½	3¼	11	$0.40
¾	3¼	13	.45
1	3½	16	.50
1¼	3¾	19	.60
1½	4	24	.70
2	4¼	33	.80
2½	4½	39	1.00
2	5	53	1.25
3½	5½	60	1.50
4	6	76	2.00

Sizes, ½ inch to 2 inches, one dozen in a box. Sizes, 2½ inches to 4 inches, ½ dozen in a box.

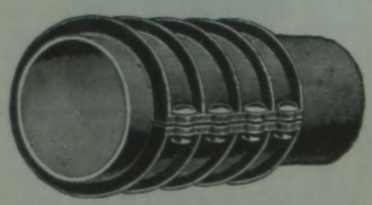


Fig. 4030

HEAVILY RE-ENFORCED FOR LARGER SIZES

A re-enforced clamp for the larger sizes of pipe made of malleable iron and painted all over; constructed with heavy ribs which insure security under heavy pressure.

Size Pipe, Inches	Length Over All, Inches	Weight Each, Lbs.	Number of Bolts	Each
4½	6½	8½	2	$4.50
5	7	11	3	5.00
6	8	14	3	6.00
7	9	16½	3	7.00
8	9½	29	3	8.00
9	10	35	3	9.00
10	11	45	4	10.00
12	12	60	4	12.00

Packed loose, painted and complete with packing.

FLEXIBLE PIPE JOINTS

MORAN

Have only three parts which all are of metal. No gasket or packing to be renewed. Positively tight under all pressures. Pressure automatically tightens joint. Can be used for steam, gas or air, and liquids.

Fig. 4031

Fig. 4032

NO. 1 for Steam, Gas or Air **NO. 3 for Liquids**

FOR PRESSURES UP TO 200 LBS.

Size, Inches	1/8	1/4	3/8	1/2	3/4
Each	$2.75	3.00	3.00	3.25	3.75

Size, Inches	1	1¼	1½	2	2½
Each	$4.25	5.25	6.00	7.50	9.00

Size, Inches	3	3½	4	4½	5
Each	$11.25	14.00	15.00	18.75	18.75

Size, Inches	6	7	8	9	10
Each	$25.00	50.00	55.00	90.00	100.00

Fig. 4033

NO. 2 ANGLE

FOR PRESSURES UP TO 200 LBS.

Size, Inches	1/8	1/4	3/8	1/2	3/4
Each	$ 3.00	3.25	3.25	3.50	4.00

Size, Inches	1	1¼	1½	2	2½
Each	$4.50	5.50	6.25	8.75	10.50

Size, Inches	3	3½	4	4½	5
Each	$12.25	15.50	16.75	20.75	20.75

Size, Inches	6	7	8	9	10
Each	$27.50	55.00	65.00	100.00	120.00

Can be furnished from ⅛ to 48-inch sizes, also in brass or bronze and for pressures up to 1000 pounds. Prices on request. Furnished in larger sizes than listed for either hub and spigot flanged or threaded connections. In ordering, state whether for steam, air or liquid and pressure under which it is to be used.

EXPANSION JOINTS

STANDARD TRAVERSE

For Steam Working Pressure up to 125 Pounds

Fig. 4034

BRASS, SCREWED

Size, Inches	½	¾	1	1¼
Traverse, Inches	2	2¼	2¼	2¼
Each	$1.50	2.20	2.75	4.00

Size, Inches	1½	2	2½	3
Traverse, Inches	2¼	2½	2½	2¾
Each	$5.00	8.00	17.50	24.00

IRON BODY, BRASS SLEEVE

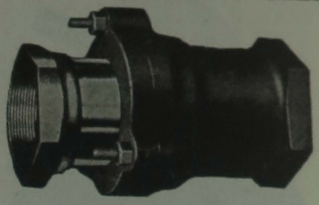


Fig. 4035

SCREWED

Size, Inches	2	2½	3
Traverse, Inches	2½	2½	2¾
Each	$7.00	8.00	10.00

Size, Inches	3½	4	4½	5
Traverse, Inches	3	3¼	3½	4
Each	$14.00	18.00	30.00	38.00

Size, Inches	6	7	8	9	10
Traverse, Inches	5	6	7	7	7
Each	$45.00	70.00	100.00	110.00	160.00

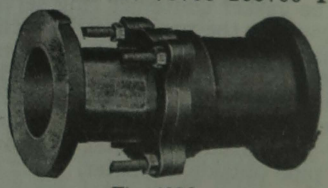


Fig. 4036

FLANGED

Size, Inches	2	2½	3
Traverse, Inches	2½	2½	2¾
Diameter Flanges, Inches	6	7	7½
Each	$15.00	16.00	18.50

Size, Inches	3½	4	5	6
Traverse, Inches	3	3¼	4	5
Diameter Flanges, Inches	8½	9	10	11
Each	$25.00	30.00	48.00	55.00

Size, Inches	7	8	10	12
Traverse, Inches	6	7	7	8
Diameter Flanges, Inches	12½	13½	16	19
Each	$80.00	110.00	175.00	250.00

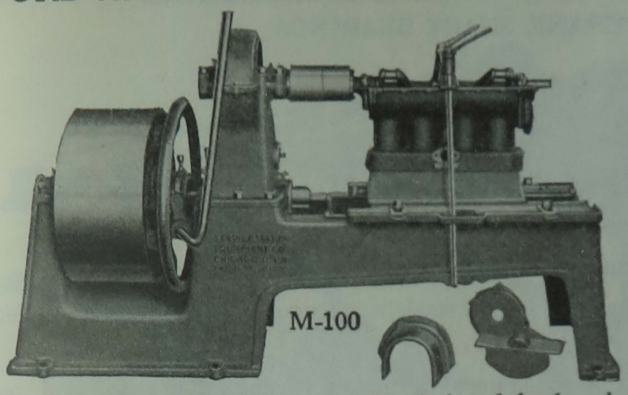
STEAM SWING JOINT

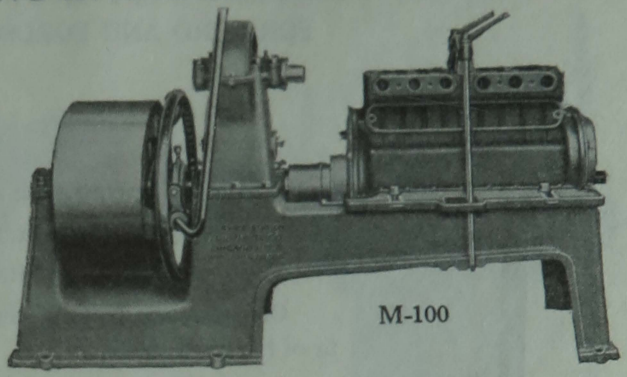
Fig. 4037

BRASS

Size, Inches	¼	⅜	½
Each	$1.90	2.20	2.50
Size, Inches	¾	1	1¼
Each	$3.50	5.00	6.50
Size, Inches	1½	2	2½
Each	$9.00	13.00	22.00

FORD AND FORDSON SPECIAL BURNING-IN AND RUNNING-IN MACHINE





This machine (M-100), especially designed for burning-in and running-in the bearings of the Model T Ford and Fordson Block, is approved and recommended by the Ford Motor Company.

The machine is a self-contained unit, the base being in one solid casting. The center of gravity is low and the weight sufficient to reduce vibration to a minimum.

The bearings on the main and gear shafts are split bronze. The gears are mounted in a machined gear case and are interchangeable. Hyatt roller bearings are used in the pulley.

Large flexible coupling on the drive shaft gives a flexibility of one-eighth inch and is guaranteed for 150 H.P.

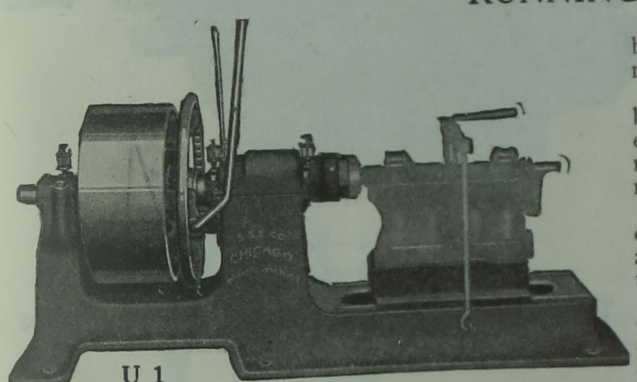
The gears are five-pitch spur gears, made of 30-point carbon drop forged steel with two-inch face. These are mounted in a case one above the other, making only one chain of gears.

The main and connecting rod bearings are burned-in in view of the operator, which facilitates the making of adjustments and tests. After the bearings have been burned-in, the motor block is turned and the bearings, connecting rods and pistons are limbered up with oil.

The Machine is constructed with a 3½ to 1 gear reduction so that the bearings may be burned-in at 175 revolutions per minute and run-in with oil at approximately 600 revolutions per minute. By experiment it has been proved that the best results are obtained when the bearings are burned-in at this speed.

Size of Flywheel	10¾ x 22½ Inches	Weight of Machine	1,800 Pounds
Weight of Flywheel	375 Pounds	Power Necessary	15 H.P. Motor
Proper Pulley Speed	600 R.P.M.		

AMERICAN UNIVERSAL BEARING BURNING-IN, MOTOR TEST AND RUNNING-IN STAND



U 1

The American Universal (U-1) is designed to burn-in the bearings of the Ford Model T and Fordson Block and to run-in and test the motor before it is placed in the chassis.

The bearings are made of nongran bronze and nickel babbitt. The machine is equipped with two speed gears to enable the bearings to be burned-in at 200 revolutions per minute, and the assembled motor at 500 revolutions per minute.

The base of the American Universal is made in one solid casting and all parts are well balanced, properly designed and of the best materials. The center of gravity is low and the weight sufficient to reduce vibration to a minimum.

In automobile factories where high production is obtained, the bearing burning-in and running-in method has long been in use. The American Universal installs factory methods in the Service Station and eliminates labor troubles and inferior workmanship. Scraping bearings by hand requires from five to twelve hours by a skilled mechanic and results in an efficiency of only 40 to 50 per cent bearing surface. With the American Universal, a bearing surface of 100 per cent is obtained in about 30 minutes.

After the bearings are burned-in, the motor is assembled and placed on the running-in stand. This enables adjustments to be made more conveniently and with less expense than if the motor were placed in the chassis.

A test wheel working in unison with the clutch enables the operator to determine the stiffness of the motor bearings without removing the block from the stand. The three-point maple block internal expanding clutch will insure quick and positive stopping at any speed.

Length Over All	85 Inches	Size of Flywheel	10¾ x 22½ Inches	Power Necessary	15 H.P. Motor
Height	36 Inches	Height of Motor Arm	26 Inches	Weight of Machine	1,250 Pounds
Width	26 Inches	Shipping Weight	1,500 Pounds		

The following fixtures can be furnished for burning-in, running-in and testing bearings of Ford and Fordson Blocks:

U-4—Fixture with Oil Sump for Burning-in Fordson and Model T Ford Cylinder Blocks at 200 R.P.M., Running-in Fordson and Model T Cylinder Blocks at 500 R.P.M.; testing Fordson Motor complete, less lower crank case, under own power, includes fixture hood for covering Fordson flywheel while testing, gasoline tank and air wash supports.

U-5—Fixture for Testing Model T Ford Motor completely assembled, including gasoline tank, coilboard and water connections.

U-6—Fixture for Burning-in Model T Ford Bearings Crankshaft in upside-down position, including flange.

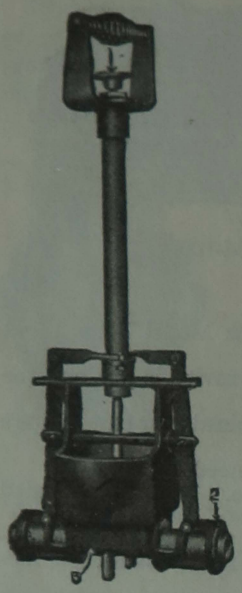
U-7—Fixture for Burning-in Fordson Bearings, Crankshaft in upside-down position.

Note.—Fixtures can also be supplied for burning-in the bearings of the Hudson, Dodge and Buick and other motors.

Prices on Application

HEMPY-COOPER BEARING BORING MACHINE AND LADLE-JIG

FOR FORD AND FORDSON CRANK SHAFT BEARINGS



C-3—Ford
C-4—Fordson

A machine for boring the main bearings of the Ford and Fordson cylinder blocks.

A ladle-jig for re-babbitting the bearings of the Ford and Fordson cylinder blocks.

Time consumed in babbitting and re-boring bearings, not over thirty minutes.

One operation bores all three bearings in one straight alignment, thus insuring perfect fit of the crank shaft.

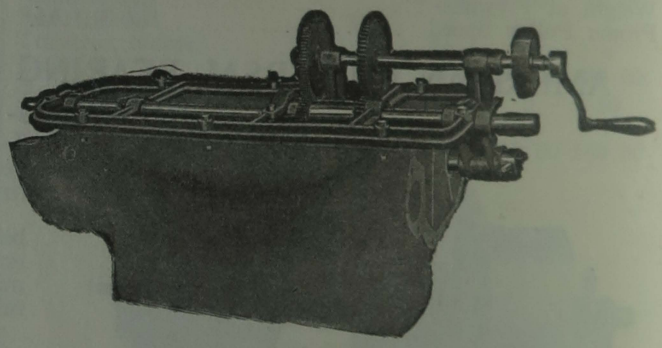
This machine, as part of your shop equipment, makes it unnecessary to send out cylinder blocks for re-babbitting and re-boring crank shaft bearings. Makes it possible to install new crank shaft bearings every time you overhaul an engine.

Saves time and expense, and nets a good profit. Guaranteed to do the work in an absolutely accurate and satisfactory manner. A gauge for correctly setting cutting tools is furnished with each outfit.

MAIN BEARING BORING MACHINE

(C-2 and C-3)
Ford Model T Boring Machine and Ladle-Jig.

(C-1 and C-4)
Fordson Tractor Boring Machine and Ladle-Jig

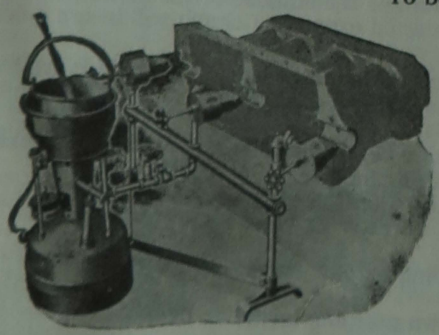


C-1—Fordson
C-2—Ford

The Above Cut Shows Manner of Attaching Boring Machine to Cylinder Block.

COMBINATION FOUR-WAY TORCH AND BABBITT POT

To be Used With Boring Machine and Ladle-Jig



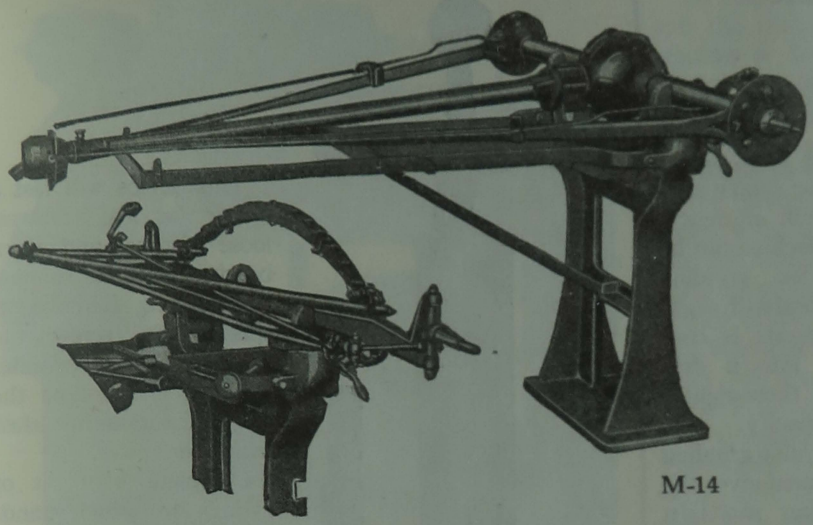
C-7

The illustration shows the torch preheating, melting and removing the old bearings from a cylinder block, at the same time melting and heating the babbitt for pouring new bearings.

The burners employed on this torch are of the most expensive and reliable type known. The heating capacity is almost ten times greater than that of the ordinary blow torches. The burners are adjustable to both horizontal and vertical positions, so that the torch can be used on both Ford and Fordson cylinder blocks. The tank is seamless pressed steel—tinned inside and out—reinforced heavy bottom.

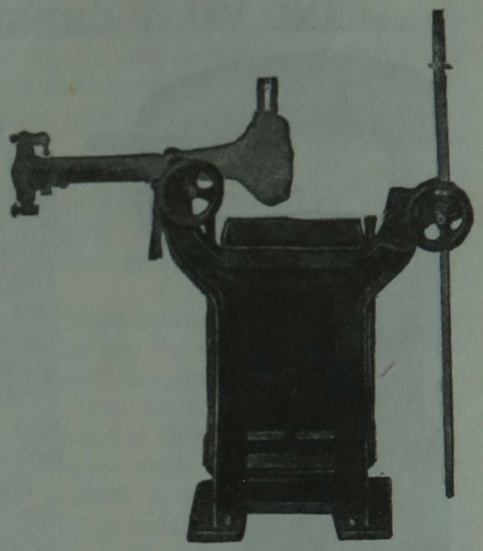
Prices Quoted on Application

DIXIE COMBINATION FRONT AND REAR AXLE STAND



M-14

Used for Front and Rear Axle Overhauling



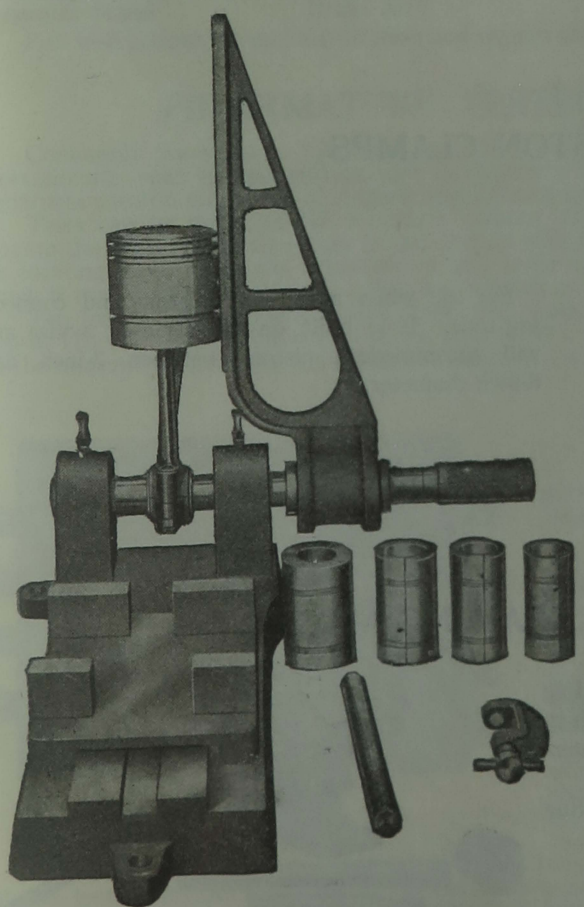
Used for Rear Axle Overhauling

The Dixie Stand is a combination clamping fixture designed to take care of the front and rear axles while they are being overhauled.

The stand is equipped with two vises; one of which tips sideways to make the axle housing accessible for the removal of the roller bearing sleeve, the other turns on a spindle to allow the easy removal of the differential and axle shaft. A heavy cast-iron grease pan is provided to catch the oil and grease from the differential when disassembled.

Height of stand, including vises, 34½ inches. Length of bed, extended, 53 inches. Vise, open, 4½ inches. Base 20x12 inches.

Net weight, 250 pounds.



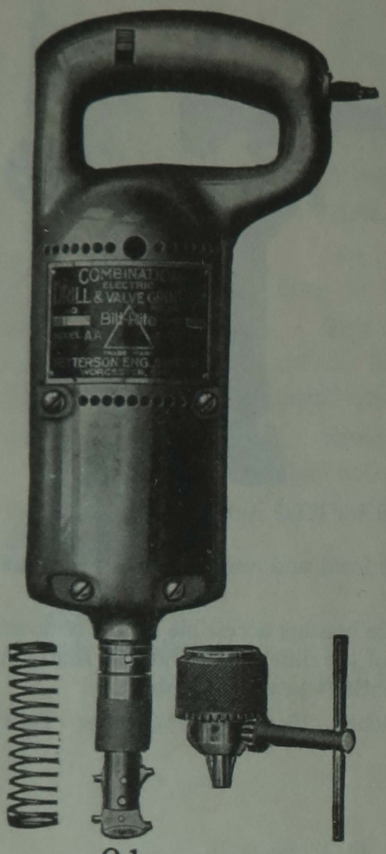
U-3

UNIVERSAL CONNECTING ROD ALIGNMENT JIG

This jig (U-3) is used for testing and straightening connecting rods. It will indicate either a bend or a twist. The device is so constructed that the assembled connecting rod and piston can be lined up correctly. The table is adjustable so that any size connecting rod may be tested. The lower arbor is standard size for the Ford connecting rods. Additional bushings are supplied to take care of the larger size rods. Weight each, 65 lbs.

Prices Quoted on Application

BILT-RITE COMBINATION DRILL AND VALVE GRINDER



O-1

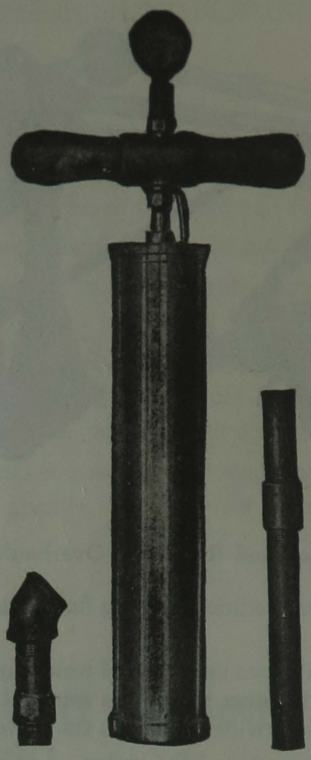
A Combination Drill and Valve Grinder in a garage or repair shop means maximum efficiency. This machine can be used for grinding valves and with slight adjustments is converted into a drill with a three-eighth-inch capacity.

The valve grinding attachment gives the oscillating motion necessary in this operation.

No screws, clutch, or other special mechanisms are necessary.

Work is completed in less time and better results obtained than are possible with hand tools.

HEMPY COOPER MOTOR TESTER

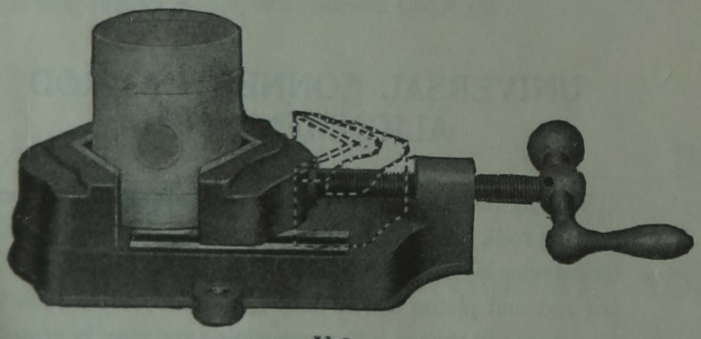


C-8

This device will test a motor for leaky valves, loose pistons, and worn bearings **without running** the engine. Remove the spark-plugs, screw the Tester into each cylinder in turn and follow the simple directions furnished with the Tester.

Complete with set of fittings for ½-inch standard, ⅞-inch S. A. E. and metric spark plug openings.

UNIVERSAL PISTON CLAMPS



U-2

For use when assembling pistons and connecting rods. It is built on the style of a vise and will accommodate pistons between 3-inch and 6-inch diameter.

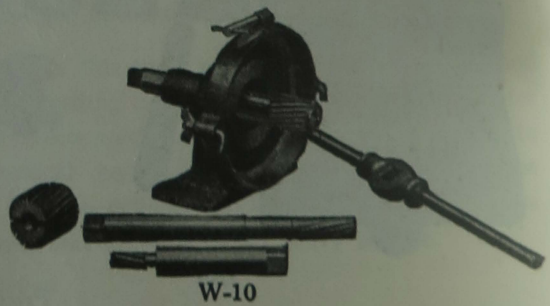
TRANSMISSION BUSHING REAMING MACHINE

This Jig is designed to hold three transmission drums or triple gears at a right angle to the reamer and in perfect alignment with it.

A set of reamers is provided having one size arbor and interchangeable cutters fitting all four sizes of bushings.

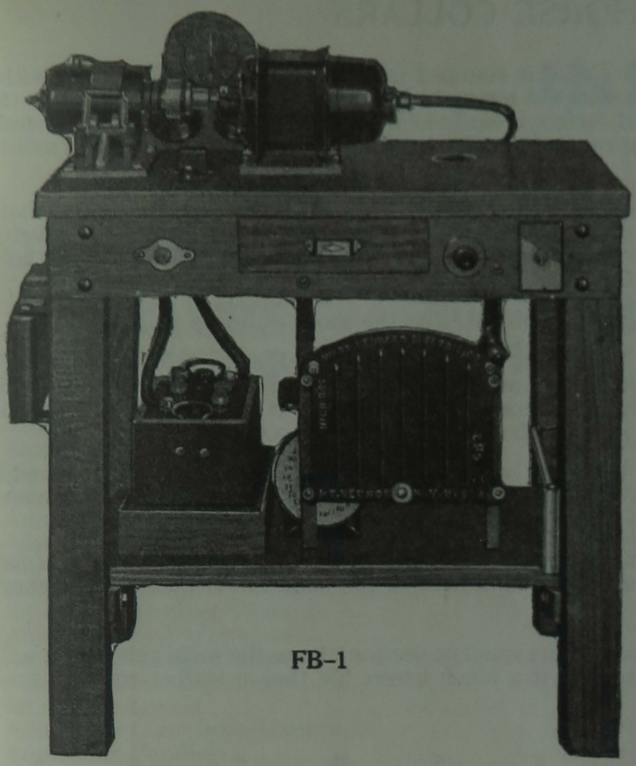
The reamers do all the cutting on the point, the body serving only to scrape the "fin edge" and polish.

Prices Quoted on Application



W-10

FB TEST STANDS



FB–1

To make a thorough and complete test of the generator and the starting motor, and to locate and repair any troubles or defects that may have developed.

The "Cutting in speed," "regulation," and "high" speed are indicated. The third brush location can be properly made only with this equipment. The motoring speed and current draw of the generator are shown as well as the "torque" or "kick" of the motor, also its running speed, while any shorts or grounds are shown by the tell-tale and test points.

Every provision is made for the proper testing and repairing of the generator and the motor, so that the operator is absolutely assured that the equipment is correct in every way after it has been tested and repaired.

The F-B Test Stand and all its equipment is made of the best materials and highest grade instruments obtainable. The stand proper is made of seasoned, kiln dried hard wood, very substantial in design and is provided with a shelf for holding battery, scale and other equipment and a drawer for special testing tools and wrenches.

The following equipment is included with stand:

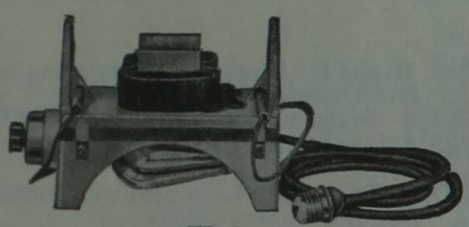
UNIVERSAL MOTOR

Operates from any 110-volt lighting circuit either direct or alternating current. Current should be specified when stand is ordered so that connection can be made at factory.

Ward Leonard Rheostat
Jones Tachometer
Double Fuse Block
Toggle Switch
Flexible Cord and Connector
Generator Stand
Flexible Cutting
Generator Lead
Generator Ammeter
Ward Leonard Cut-Out
Cut-Out Switch
Brake Arm
Scale
Swinging Bracket
Motor Ammeter
Motor Lead
Starting Switch
Exide Starting Battery
Lead Lined Battery Box
Hubbell Socket
Test Points
Tell-Tale Light

Full instructions for making all tests and repairs are furnished with each stand.

FB ARMATURE TESTER



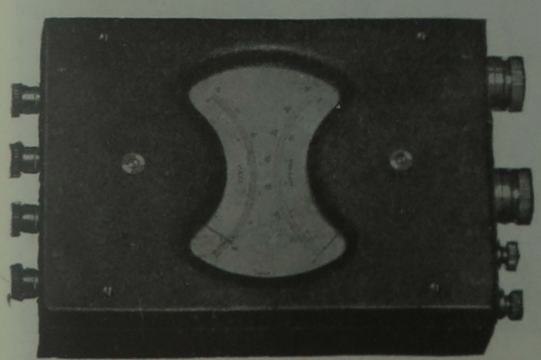
FB–3

Commonly known as a "Growler," is a device for instantly locating short circuits, open circuits and grounds in either the motor or generator armatures used on any make of starting and lighting system.

Tests can be made on the armature without the necessity of removing the bearings. A set of test points and an indicating lamp are used for locating grounds on the armature or any other electrical device on which it may be desired to make a test for grounds or open circuits.

Ten feet of Duplex motor cable, fitted with standard plug for insertion in 110 volt AC circuit is part of the equipment. A switch mounted on the instrument gives instant control of the device without the necessity of detaching the cable for each test.

FB TEST SET



FB–2

A complete electrical testing outfit by means of which the service man can quickly and easily locate any troubles that may be experienced with any make of starting and lighting systems.

Large, substantial binding posts are provided on one end of the case for measuring heavy current and rubber insulated binding posts on the opposite end for voltage readings. The scale on all the meters is five inches long, giving an idea of the size of the graduations and the accuracy with which the readings can be taken.

The voltmeters and ammeters have zero correction devices, conveniently located. They are well protected by the substantial casing as well as the heavy plate glass over the face of the scales, so there is no danger of damaging the instrument.

A special cadmium lead is provided with the TEST SET with a standard binding post connector on one end and a rubber covered cadmium stock on the other. This lead is used with the specially marked cadmium scale on the voltmeter for making complete cadmium tests on any make of battery.

The SET is provided with special cables and terminals adaptable for use on the Ford car. These cables are made of such length and carrying capacity, however, as to be able to take care of any job.

A very complete and fully illustrated book of instructions, very simply written, is provided with each TEST SET.

Prices Quoted on Application

FLEXIBLE METAL HORSE COLLARS

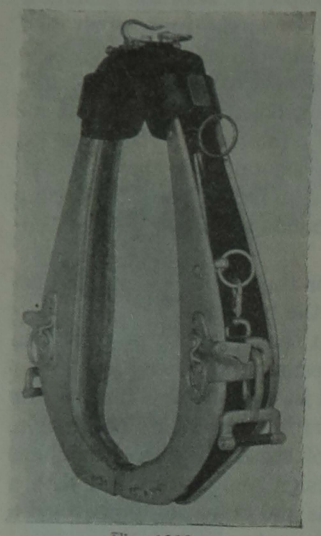


Fig. 4038

The Flexible Metal Horse Collar is stamped from sheet steel, heavily coated with zinc. Its shape and the adjustments at top and bottom allow it to conform perfectly to the horse's shoulders. Its hard surface is easily kept clean and will not retain sweat and dirt to blister the skin. The sweat pad so often used keeps the horse's skin always moist and soft.

No carpenter ever uses a soft padded handle on his hammer. He has found that hard polished wood is easiest on his hands; the skin soon becomes calloused and tough. In the same way the skin on horses shoulders becomes tough and will not gall in hot weather.

The slight "give" to the Steel Collar takes up the shock of heavy pulls.

A leather-faced collar will wear out eventually but the Flexible Metal Collar will last a lifetime. It will stand all sorts of hard knocks, and when needed a little paint will restore its newness. All wearing surfaces are heavily coated with zinc. When used against sore shoulders, the cooling touch of this metal has a positive curing action.

It has a hinge at top and a snap at bottom so that it can be opened and put on and off quickly without passing over the horse's head. Snaps at the sides allow the harness to be detached entirely with a very few motions.

The Flexible Metal Collar has been tested and adopted by the U. S. Government for Field Artillery service and by many fire departments, ambulance services, and emergency wagons.

For mining use, the Flexible Metal Mule Collar on account of its small projection above the mule's shoulders will clear low ceilings more readily. Its resistance to hard knocks gives it a much longer life than a leather collar in this service.

NOS.—Horse Collars	1	2	3	4	5	6	7	8	9
NOS.—Mule Collars	1A	2A	3A	4A	5A	6A	7A	8A	9A
Inside Adjustment, Inches	13½–15	15–16½	16½–18	18–19½	19½–21	21–22½	22½–24	24–25½	25½–27
Each	$12.50	$12.50	$12.50	$12.50	$12.50	$12.50	$12.50	$12.50	$12.50

DESCRIPTION OF PARTS

NO. 1L and R—Hinge used in swinging harness Fire Department Collars.
NO. 2—Bridge used with steel pad No. 1 Hinge.
NO. 2AL and 2AR—Expansion hinge top of Collar.
NO. 3—Back Strap Loop used with leather pad Fire Department Collars.
NO. 4—Side ring and bracket for double back strap.
NO. 4AL and 4AR—Expansion hinge for top of Collar.
NO. 5AR and 5AL—Self-locking Trace Hook.
NO. 5BL and 5BR—Latches for Trace Plate.
NO. 5C—Quick hitch loop made in 3 sizes 2, 2¼, 2½.
NO. 6—Trace Plate made in 3 sizes, 2, 2¼, 2½.
NO. 6A—Bolt for Trace Plate No. 6 made in 3 sizes, 2, 2¼, 2½.
NO. 7AL and 7AR—Hinge for Universal Type Collar.
NO. 7L-7R—Used on Artillery Collar only.
NO. 8L—Leather pad to Universal Type Collar.
NO. 8Z—Steel Pad Zinc Plated.

Size—	0	1	2	3	4	5	6
Span—	3⅞	4¼	5⅛	5½	6	6½	7

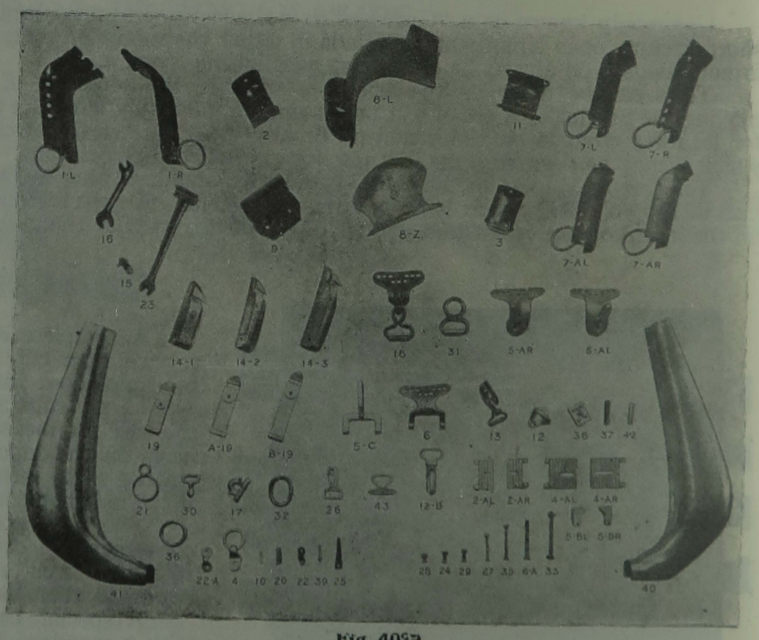


Fig. 4039

NO. 9—Draft Spring.
NO. 10—Spring, to 5BL and 5BR.
NO. 11—Connection used with Steel Pad only.
NO. 12—Pole Chain Bracket.
NO. 12B—Pad on Water Hook for Universal Collar.
NO. 13—Pad on Water Hook Artillery Collar.
NO. 14-1—Buckle Complete.
NO. 14-2—Buckle Complete.
NO. 14-3—Buckle Complete.
NO. 15—Bracket for Suspending Collar in Fire Department use.
NO. 16—Wrench.
NO. 17—Brace to hold link for pole. Chain snap where swinging harness is used, see 27 for Bolt only.

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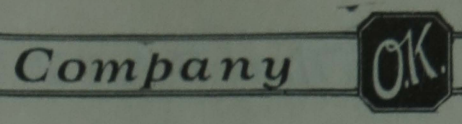

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